

**DESCRIPTIVE FLORA**  
**OF THE**  
**MALTESE ISLANDS**  
**INCLUDING THE**  
**FERNS AND FLOWERING PLANTS**

**BY**

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## INTRODUCTION

### I.

#### The Study of the Maltese Flora.

The first Maltese writer who makes mention of the native and cultivated plants of the Maltese Islands was Commendatore Fra Gio. Francesco Abela, who in his *Descrizione di Malta con le sue antichita' ed altre notizie*, 1647, gives full particulars of the plants then cultivated in Malta, chiefly on account of their economic value. He mentions (page 374, Ciantar's Edition), that Tommaso Porcacchi describing Malta makes reference to the groves of copious palms and to the abundant production of wheat, linen, cotton and cummin, and that many trees produce fruit twice a year. Abela mentions also (page 375 *ibid*) that the ancient writer Quintinus has referred to the very sweet-scented roses of Malta, known even to day by the name of *Warda ta Malta*, a variety of *Rosa gallica*, and made further reference to the palm trees, the olive-groves and the vineyards, the fig trees and other fruit trees the same as grown in Italy. Abela gives full details of the cotton cultivation which many centuries before had been referred to by Diodorus Siculus, as well as by Cicero and Lucretius. In Abela's time cummin was grown and exported on as large a scale as at present. Anise was also grown for home consumption and for export. Woad "glasto" (*Isatis tinctoria*) which was then grown for the extraction of a blue dye, has long ago disappeared from our fields. Wheat, barley, and many kinds of legumes and vegetables were grown almost as copiously as at present. In the work above mentioned (Book 1, Not. X, page 349), Abela gives an account of *Cynomorium coccineum*, under the name of Fungus, which he states is found in Gozo on the islet of Hagret il General and on the opposite coast of Dwejra. Abela makes no mention of sulla (*Hedysarum coronarium*), our most important forage plant, which was introduced into cultivation from Africa, much later, towards 1750.

The Maltese physician Gian Francesco Buonamico wrote of the same *Cynomorium coccineum*, under the title *De fuco spicato coccineo melitensi*, and in 1670 published his *Brevis notitia plantarum quae in Melitae et Gaulos insulis observantur*, enumerating 243 species, both native and cultivated. The Maltese physician and philosopher, Fred. Philippus Cavallini, in 1689, published his *Pugillus meliteus seu Herbarum omnium in insula Melita ejusque districtis enascentium perbrevis enumeration*, bringing the total number of species native or cultivated, to 326.

The celebrated Sicilian monk Paolo Boccone, in his work *Icons et descriptiones plantarum Siciliae, Melitae, Galliae et Italiae* published at Oxford in 1674, mentioned and figured some of our native plants, among which *Cynomorium coccineum*. Another Paolo Boccone, gentleman of Palermo, Botanist to the Grand Duke of Tuscany, and afterwards a Cistercian monk, under the name of Don Silvio Bonnone, in his *Museo di piante rare della Sicilia, Malta, Corsica, Italia, Piemonte e Germania*, published at Venice in 1697, makes mention of a few of our native plants, among which the rare fern *Asplenium marinum* collected for him in Gozo by the chemist and druggist Narduccio Murmuro.

The Swedish botanist Petrus Forskaal, in his posthumous work *Flora Aegyptiaco-Arabica* published in 1775, inserted a short list of Maltese plants including 9 cultivated species, and 78 native, collected for him by the Maltese doctor Giorgio Locano.

Jean Dumont D'Urville, an officer of the French navy, published in 1822 his *Enumeratio plantarum quas in insulis Arcipelagi aut littoribus Ponti Euxini annis 1819 et 1820 collegit atque detexit*. This work was published as a contribution to the *Memoires de la Societa' Linneenne de Paris, Vol. I*, and in it D'Urville mentions 43 of our native species, and for the first time gives a description of *Micromeria microphylla* or *Satureja microphylla* (Urv.) Guss. under the name of *Thymus microphyllus* Urv.

In 1825 Father F. Carlo Giacinto, of the Discalced Carmelites, Professor of Botany in the Malta University, published in collaboration with Dr. Agostino Naudi and Dr Stefano Zerafa, a list of 854 species of Phanerogams and Cryptogams natives and cultivated in the Islands of Malta, Gozo and Lampedusa. Of these, according to Delicata, 357 Phanerogams and 14 Cryptogams were natives of Malta and Gozo. The same author had published in 1811 a work on Agriculture, *Saggio di Agricoltura per le isole di Malta e Gozo*, in which he mentions *Cynomorium coccineum*, saying that the species grows not only in Gozo, but also in Malta near Casal Dingli, and incidentally mentions also several other species of native plants.

The first real attempt at a comprehensive Flora of Malta, was made by Dr Stefano Zerafa, Father Giacinto's successor in the chair of Botany and Natural History in the Malta University, who in the year 1827 and 1831 published his *Florae Melitensis Thesaurus, sive plantarum enumeratio quae in Melitae Gaulosque insulis aut indigenae aut vulgatissimae*. Zerafa enumerates 644 species, of which 9 Cryptogams and 489 Phanerogams are indigenous in these Islands. Zerafa was the first to describe in this work the very interesting *Centaurea crassifolia* Bert., an endemic species special to the Maltese Islands, under the name of *Centaurea spathulata*, Professor Zerafa may well be called the Father of Maltese Botany.

In 1838 P. Brenner in his chapter on Botany published in Badger's Historical Guide to Malta and Gozo (Description of Malta), gives a brief sketch of our Flora, and calculates the species of our native Phanerogams at 700.

Federicus Carolus Nyman, a Swede, in his work published at Holm in Sweden in 1845, gives under the heading of *Om Maltas Vaarvegetation*, a list of 73 maltese species of Phanerogams collected by him, and describes a variety of *Parietaria officinalis* under the specific name of *Parietaria populifolia*. He was also the first to mention some of our Mosses.

In 1849, the first work of Dr. Gian Carlo Grech Delicata, *Plantae Melitae lectae secundum systema Candolleanum digestae*, was published in the Transactions of the Academy of Sciences of Stockholm, along with a preface written for the occasion by J. E. Wikstroem. This work is a list of 400 species of Phanerogams natives of the Maltese Islands.

The same author, who afterwards succeeded Professor Zerafa in the chair of Botany and Natural History in the Malta University, published in 1853 his principal work, viz: *Flora Melitensis sistens stirpes phanerogamas in Melitae insulisque adjacentibus hucusque detectas, secundum systema Candolleanum digestas*. In this work Dr. Grech Delicata enumerates 716 species of Phanerogams natives of the Maltese Islands, that is, 549 species of Dicotyledons and 167 of Monocotyledons. This work, complete and accurate in its details, continued long as the standard Flora of Malta, although of course many of the species mentioned are considered today rather as mere varieties.

In 1869, in the *Bulletin de la societe' Botanique de France*, Tome XVI p.p. 235-255, Dr Gavino Gulia published a list of the Maltese Compositae, under the name of *Stirps Compositarum florulae Melitensis*. The same author, who in 1880 succeeded Grech Delicata in the chair of Botany in the Malta University, published between the years 1871 and 1877, in the local scientific journal *Il Barth* Vol. I and II, under the name of *Maltese Botany*, the analytical tables of 26 families of Maltese Phanerogams. Dr Gulia did not complete his work so as to cover all our Phanerogams. Afterwards, when appointed Professor of Botany and Natural History, he was engaged on the manuscript of an *Analytical Flora of Malta*, when he died at the early age of 54 years. The work of Prof. Gulia shows that he was a capable and painstaking man of science, and he made important contributions to the knowledge of our Natural History.

J.F. Duthie, who afterwards was Director of the Botanical Department of Northern India, visited the Maltese Islands on two occasions in the years 1871-72, and 1874; and in the *Journal of Botany British and Foreign*, published classified lists of plants collected by him on both his visits. He also published an alphabetical list of Maltese plants in the local journal *Il Barth*, in 1875. Duthie has added 36 new species to those already known in our Flora, besides 13 species of new additions for Malta, and 4 new additions for Gozo. He also gives a list of the Phanerogams of Cominotto, collected by him in April 1874. No other author who is not a native of these Islands has contributed so largely to the knowledge of our Flora.

Prof. F. Debono, who succeeded Gulia as Professor of natural History, published in *Il Naturalista Maltese, Rivista di Scienze naturali*, Anno 1, p. 4 to 7, an analytical table of Maltese Ranunculaceae.

Other writers, viz: Colonel M. J. Godfrey, Reverend G. M. Godwin, Reverend George Henslow, Reverend E. Armitage, Mrs Drage, and others have collected plants or made contributions to the knowledge of our Flora, but it is chiefly to Count Dr. Alfredo Caruana Gatto that we owe a more thorough study of our indigenous plants, and the corrections of many errors which had crept into the identifications or readings of his predecessors Dr. A. Caruana Gatto, between 1890 and 1913 contributed several notes on our Flora. In *Il Naturalista Maltese*, 1890, he published a list of rare species and new varieties of Maltese plants. In the same journal he published a list of Maltese Liliaceae; besides other notes published in the *Mediterranean Naturalist*, 1891-93, on *Ophrys apifera*, *Cynomorium coccineum*, Albinism and colour variation in Maltese wild flowers; on indigenous plants which have disappeared, etc. In the special number of the *Daily Malta Chronicle* April 1913, the same author published a Review of the Fauna and Flora of the Maltese Islands.

Dr Stefano Sommier, in 1907, published in the *Nuovo Giornale Botanico Italiano*, Vol. XIV, p. 496-505, along with a plate, a note giving a very full description of a new genus and species of the Composite family, viz: *Melitella pusilla*, which he had discovered in Gozo in the preceding spring. Other notes on our Flora were published by the same eminent botanist between 1906 and 1911, on the last occasion in *Bull. della Soc. Bot. Ital.* 1911, p. 76 publishing two new plants for the Flora of Malta and of Italy, viz: *Cornucopiae cucullatum* L. a grass found by him in Gozo, and *Convolvulus oleifolius* Desv. found in Malta, and probably long confused with *Convolvulus Cantabrica* L.

The preceding notes are only meant to convey a knowledge of the progressive development of the study of our Flora, but a complete Bibliography has been included by Dr Stefano Sommier and Dr A Caruana Gatto in the *Flora Melitensis Nova*, which is the immediate predecessor of the present work.

The *Flora Melitensis Nova* is an exhaustive work of 502 pages in royal 8vo., published in Florence in 1915, mainly at the expense of the Italian government, as an Appendix to the *Bollettino del R Orto Botanico e Giardino Coloniale di Palermo, Anno XI*, and to the *Bollettino del R. Orto Botanico di Palermo, Nuova Serie, Vol.I*. It includes a list of all our Phanerogams and Cryptogams known up to 1915. The Phanerogams include 902 species, besides 3 other given in the Addenda, with full references and details as to habitat, the authors adopting De Candolle's system of classification in order to bring their work in line with the *Flora Melitensis* of Delicata. The Cryptogams include a total of 1085 species, namely 499 species of Fungi, 296 of Algae, 183 of Lichenes, 78 of Musci, 18 of Hepaticae and 11 of Pteridophyta. Many species of Phanerogams and Cryptogams are now generally accepted only as varieties or subvarieties, but this fact does not in the least detract from the great value of the work, which was reviewed at length by the present writer in the *Daily Malta Chronicle* of the 15<sup>th</sup> February 1916.

The *Flora Melitensis Nova* includes also introductory notes on the climate, the geology and the history of these Islands, as well as on the aspects of our Flora; and very useful comparative tables of our Flora are given in reference to the Flora of the Pelagic Islands of Lampedusa and Linosa, which had been

previously studies by Dr. Sommer (*Flora delle Isole Pelagiche*), as well as in reference to the Flora of Sicily, Pantelleria, North Africa, and the East. The work is moreover furnished with an excellent plate showing the new species *Melitella pusilla* Sommer, and its form *laciniata* Borg, of which there is a full description at page 196, reproduced from the *Nuovo Giornale botanico italiano, Nuova Serie XIV p. 496*.

The author of the present work had made many contributions towards the knowledge of our Flora, both native and exotic, in the *Daily Malta Chronicle* and in the *Archivum Melitense* between the years 1896 and 1920. He published in 1899 the first work, in Maltese, on the Cultivation and Diseases of the Orange tribe (*Il Biedja u il Mard tal Agrumi fil Gzejjer Taghna*), to which followed in 1900 two lectures on the Cultivation of Orange trees and on their Diseases and their treatment, delivered at sittings of the Malta Archaeological and Scientific Society, held at the Governor's Palace, Valletta. He had also prepared a classified catalogue of the plants cultivated at San Antonio Gardens which was given an alphabetical form by Prof. Debono, and was published by the Government Printing Office in 1896. In the Special Number of the *Daily Malta Chronicle*, April 1913, he contributed an article on the Agriculture and Horticulture in Malta; and in Macmillan's *Malta and Gibraltar Illustrated*, in 410, published in London in 1915, he contributed another article of 15 pages on the same subject, in which he refers to the various fruit trees and field crops grown in Malta, and mentions the principal species of ornamental trees and shrubs now cultivated in our gardens. He had been employed for some time on his work *The Cultivation and Diseases of fruit trees in the Maltese Islands*, which was published at the Government Press in 1922. This work consists of 622 pages in 8vo., and gives a full description of the species of fruit trees and of all their varieties and forms cultivated in the Maltese Islands, along with brief descriptions of their diseases, insect pests and fungous parasites, to which they are subject, as well as their treatment. In this work, which was also very received abroad, the author was the first to attempt a full description of all the local varieties of fruits grown in the Maltese Islands, many of which were unknown outside the narrow limits of these Islands; and particularly in the chapter dedicated to the Vine, he describes 122 sorts of grapes, of which at least 37 are local varieties. The same author in 1924, published another work, in Maltese, on the cultivation of American Vines (*Il Biedja tad-Dwieli Americani fil Gzejjer Taghna*). This work consist of 148 pages in large 8vo., and was published as part of the *Enciclopedia Maltia*, and includes full details concerning the cultivation of vines on American stock.

The present work is not meant to replace the *Flora Melitensis Nova* of Sommer and Caruana Gatto, and indeed it is written on entirely different lines and with quite a different purpose. Many of the visitors and residents who stop in these Islands during the months of winter and spring, take a lively interest in our native plants and go out frequently on botanical excursions, but the existing works on Maltese Botany are either out of print and unobtainable, or if obtainable are not found of much assistance by beginners in the study of our Flora. Moreover, many of my friends and the students of Botany at our University have expressed to me the disadvantage in which they find themselves owing to the want of a descriptive work on our flora, and the consequent difficulty which is often met with in identifying the plants which they collect. Besides, since the publication of

the *Flora Melitensis Nova* in 1915, many species and varieties have been found here and there in these Islands, and the rarer plants have been collected in other localities besides those mentioned in that work, so that in many points a revision of the *Flora Melitensis Nova* has become necessary. The present work includes brief descriptions of all genera, species, varieties and forms of vascular plants (Phanerogams and Pteridophyta) known to exist in the Maltese Islands, along with the characters of the families, the whole classified according to the latest system now adopted by botanists. There are also introductory chapters on our geology and climate, and on the general aspects of our Flora; the chapter on geology being necessarily rather lengthy, as it is meant to be really useful to those who take special interest in this branch or our natural history.

## II

### GEOLOGY

The Maltese Islands are situated in the northern hemisphere, latitude 35°, 53' and 50", and longitude 14°, 31' and 7" from Greenwich, in the middle of the Mediterranean, at a distance of about 96½ kilometres (about 60 miles) from Cape Passaro the nearest point in Sicily. These Islands constitute the ridge of a vast bank which joins Sicily with Africa, and divides the Mediterranean into a western and an eastern basin, which in some parts reach a depth of over 2000 fathoms. The sea bottom between Malta and Africa hardly reaches 200 fathoms in depth, and nearer to the African coast becomes very shallow over extensive tracts. Immediately to the south of the Maltese Islands the sea bottom descends almost abruptly to a depth of about 300 fathoms, forming an extensive hollow which in all probability was an inland sheet of sea-water in Pliocene times. On the other hand the sea bottom which connects the Maltese Islands with Sicily, only in a few points has a depth slightly exceeding 70 fathoms. Therefore from the geological as well as from the geographical point of view the Maltese Islands sometimes erroneously described as African Islands, really belong to the continent of Europe and may be said to represent the southern fragments of Sicily. This view is further strengthened by the fact that the Maltese islands are not of volcanic origin, but are the remnants of a much vaster region which at a comparatively recent geological epoch formed a broad bridge between Italy and Africa; and it is moreover to be noted that the geological formations of the Maltese Islands are to all practical purposes identical with the geological formations of the southern angle of Sicily as far as Syracuse. However, there is important evidence to show that the Maltese Islands have become separated from Sicily not later than the Pliocene; and at the same time the present configuration of the southern coasts of the Maltese Islands, towards Africa, does not appear to be anterior to the early Quaternary, although there is no sure



evidence to show that the whole sea bottom between Malta and Africa had not become submerged before the Quaternary, in fact the island of Lampedusa is wholly a Pleistocene formation. It is likely that the vast hollow in the sea bottom on our southern coast, representing an area more than 20 times the size of the Maltese Islands, was in the Pliocene and perhaps also in the early Quaternary, a large sea-water lake, about 200 fathoms deep.

The Maltese Islands consist of the two sister islands, Malta and Gozo, separated by a channel about 5 kilometres broad. In this channel there is the Islet of Comino, and the much smaller islet of Cominotto, along with smaller rocks. The high and precipitous rocky islet of Filfla is situated at about 5 kilometre to the south of Malta, to which it is connected by a bank nowhere reaching 50 fathoms below sea level. The islets or rocks of Selmun, Għallis, Gzira etc are in continuation with the northern coast of Malta; and Hagret il-General or General's Rock, and other smaller rocks are in continuation with the coast line of Gozo. Malta has an area of about 246 square kilometres (about 95 square miles), and the area of Gozo has an area of about 51 kilometres (about 20 square miles); the area of Comino and Cominotto, is about one square mile. The highest point of Malta at Gebel Ciantar or Ta Zura near Dingli, is 251.7 metres (826 feet) above sea level, while the highest point of Gozo is only 176.7 metres (580 feet). The aspect of both Islands is therefore flat, the altitude being nowhere sufficient to have an appreciable influence on vegetation, but of course Gozo has a more hilly aspect, owing to its smaller size.

The stratigraphy of the Maltese islands, as shown by Spratt (1843), by the Earl of Ducie (1854), by Leith Adams (1860), by Fuchs (1872), by Murray (1890), and by others, consists essentially of marine formations of the Tertiary age, with a few alluvial formations, conglomerates, and ossiferous deposits of the Quaternary. These Tertiary formations consist of five strata, the lower most of which is made of the Lower Coralline Limestone, to which follow conformably the Globigerina Formation, the layers of Marls and Clays, the layer of Greensand, and the Upper Coralline Limestone. There are, moreover, well-marked faults, with consequent breaks or dislocations of the layers, as well as minor faults in the same layer or formation, here and there assuming the aspect of true step-faulting, but more often reduced more or less to a simple jointed fracture. Before proceeding further with this brief description of the strata it is necessary to convey a knowledge of the more important faults of our stratigraphy.

The largest and most important fault is situated along the southern coast of both Islands, from south-east to north-west, owing to which the strata, particularly in the Island of Malta, have been upheaved and tilted from that side, with a consequent dip more or less from south-west to north-east. Owing to this fault the Lower Coralline Limestone, along with the super-incumbent strata have been raised considerably above the sea level from Benghisa point to Fomm-ir-rieh in Malta, and from Imġar ix-Xini to Cape San Dimitri in Gozo. Therefore, along this coast, with the exception of the tract of land called Gzira, near Għar Lapsi and opposite Filfla, the Lower Coralline Limestone forms an almost perpendicular wall or escarpment down to the sea; and in certain points as at Tal Usief (Madliena) near Boschetto, descending down to over 50 fathoms below sea level. The dip of the overlying strata, particularly of the Globigerina beds from

south-west to north-east, is usually an important consideration with quarry-men for the regular cleavage of the rock in quarrying stones for building purposes. From this principal fault originate most of the other important faults in both Islands, proceeding more or less perpendicularly to it, and therefore more or less parallel to each other. This fault of primary importance obviously affects also the deeper underlying strata, possibly farther down than the Eocene, and to it must be attributed the submersion of the land to the south of both Islands, and probably also their separation from each other and the present configuration of the coast line. There are indications which appear to point out that the submersion of this land has taken place in the early Quaternary, but it is likely that the fault itself has developed in the Pliocene and the submersion has commenced also in the same period, the land in question surrounding the large salt lake above mentioned and extending to the east over the Hurd Bank, being reduced to the condition of a low-lying morass.

Of the secondary faults which originate from this fault and affect the entire surface of the Islands, the following are the more Important.

- 1) The so-called Great Fault in Malta (Maltese - *It-Targia*, - the step), which arising at Fomm ir-Rieh from the principal fault or backbone fault, takes a direction to the north-east as far as id-Dahar near Bahar ic-Ciaghak. The direction of this fault, as well as the upheaval of the Lower Coralline Limestone along the eastern side of the fault, which forms the chain of hills or escarpements of Id-Dahar, Mdliena, Gharghur, Naxxar, Musta, Ta Falca with the outcrop as far as Burnahhala with the hills of Dwejra, Bingemma and Fomm ir-Rieh, show that along with its formation the north-east part of the Island has undergone a subsidence or partial submersion, owing to which the Munxar rocks at Birzebbugia and the Hurd Bank have subsided below sea-level, with the consequent formation of the bay of Marsascirocco and of the harbours of Valletta.
- 2) The second and third of these faults have contributed to the formation of St. Paul's Bay on the northern coast, and of the inlets of Gnejna and Ghajn Tuffieha on the southern coast. One of these faults arises from the principal fault near Ras il Pellegrin at Rdum il Pellegrin to the south of Gnejna and proceeds somewhat irregularly towards the inlet tal Ghazzenin at St. Paul's Bay, reappearing at Bugibba and Kaura. The other originates at Meijesa below the Kortin ta ghajn Tuffieha and takes a direction along the place called Dar il Bajda and along the Pualet below the escarpement of ix-Xaghra tas-Simar or tal Ghansal, to Rdum ic-Ciaul close to Mistra in St. Paul's Bay, crosses that inlet to Rdum il Bies and finishes at the islet of Selmun. The layers between these two faults are considerably depressed, forming the broad valley-like district of Pualet and Manicata.
- 3) the fourth and fifth fault have contributed to the formation of the Bay of Mellieha on the northern coast, and of the inlet of Rdum ix-Xkuk and of ic-Ciumnija on the southern coast. One of these faults proceeds from Rdum ix-Xkuk along Kasam Barrani to Gnien Inghra and Ghajn Zejtuna, finishing at Ghajn Hadid; the other fault starts at Ras il Kammieh, passes along Rdum il Kammieh to Ghar Bakrat and finishes near Dahlet ix-Xileb at the Ponta tal

Ahrax. The layers included between these two faults are still more depressed and in part submerged, owing to which the Upper Coralline flanks the sea on both coasts, forming the hill of Gudia at the head of Melleha Bay, and through the depression of l'ghadira and the low-lying tract as far as ic-Ciumnija, almost separating the Ahrax from the rest of Malta.

- 4) Another fault is seen along the north-east coast of Comino, and in all probability continues under the sea to join the principal fault which very likely stretches along the sea bottom from Fomm ir-Rieh in Malta to reappear at Imgiar-ix-Xini in Gozo. To the lateral upheaval caused by this fault may be ascribed the dip of the layers of Comino, more or less apparent, towards the north-west.
- 5) In Gozo there is a fault which arising from the principal fault at Imgiar-ix-Xini proceeds to the east across Ghajnsielem to Kala, finishing in various minor faults at Ras il Kala. Another fault originates at Dueira and proceeds towards the east across San Lorenzo and terminates in the valley of Xlendi close to Munxar, to the south-west of Sannat. A third fault connects the inlet of Imgiar-ix-Xini with that of Xlendi, proceeding along the valley of Imgiar-ix-Xini, the Sannat valley, to Munxar, and includes the high escarpment of Ta Cenc entirely formed of the Lower Coralline Limestone, with overlies of Globigerina beds at Ta Cenc and Sannat. As is also the case in Malta, the first mentioned of the Gozo faults has an important bearing on the water-supply, as it is owing to it, and to the direction and dip of the strata of the central part of the Island towards the east, that we may attribute the existence of the deep springs of potable water at Ghajnsielem or Migiarro and at Imgiar-ix-Xini.

Mention may be made, also of the so-called circular faults, which have no connection with the principal fault or with its ramifications, and in all probability are not due to tectonic movements, but are purely carsic phenomena, that is, are due to the subsidence or falling in, of the upper layers over deep caverns caused by the action of subterranean waters, such as are noticeable in the region of the Carso in upper Italy. We have five of these circular faults, viz: the complete circular fault of ic-Cirkeuua opening on the sea at l'Ahrax near Marfa in Malta; the incomplete circular fault of Comino, between Comino, Ponta Irkika and Cominotto; the circular fault of Gozo at kala id-Dueira partly completed by the islet of Hagret il General, and the circular fault of Ras id-Dueira, close to the proceeding, which is also in communication with the sea through an opening in the high and wall-like rim of rock enclosing it.

The following is a brief description of the five principal layers or geological formations constituting the stratigraphy of the Maltese Islands.

1 THE LOWER CORALLINE LIMESTONE (*Unterer Kalkstein* of Fuchs, *Lower Coralline Limestone* of Murray), is an Oligocene formation. According to Dr. Bather of the British Museum, it corresponds to the Tongrian, from Tongres in Limbourg. Our Lower Coralline Limestone is divisible into two strata, often neatly distinguishable, but sometimes passing gradually into each other. The lower layer is a very hard and compact limestone, of crystalline texture, sometimes of flinty texture with conchoid fracture, impermeable or almost impermeable to

water, called in Maltese *Kawwi* or *Zonkor tal prima*, which would correspond to Oligocenic Sannoisian of Paris. The upper and softer layer, also often crystalline, but more commonly saccharoid, called in Maltese *Kawwi* or *Zonkor tas-seconda*, would correspond to the Oligocenic Etampian (Stampiano) of Etampes in France. This upper layer contains many remains of Echinoderms, chiefly *Scutella striatula*, and hence called also *Scutella striatula* Layer. In several points in both Islands this upper or *Scutella* layer is missing, and the lower layer either outcrops directly or lies unconformably immediately below the lower layer of the *Globigerina* beds.

The Lower Coralline Limestone forms therefore the basement of the Maltese Islands, and in Malta outcrops near Zabbar and at San Tumas and Marsascala, reappearing more or less along the eastern half of the southern coast of the Island, as well as in the central part at Wied Encita near Hattard; forms also the principal mass of the escarpement along the Great Fault from San Julians' and id-Dahar, where it descends into the sea, to Burnahhala at the foot of Bingemma, along Gargur and Naxaro to all the district of Musta, and again outcrops along the coast at Bahar ic-Ciaghak to Kaura, where this limestone takes a red colour mottled white, and is capable of a high polish. In the Island of Gozo, the Lower Coralline Limestone forms the principal mass of the heights or escarpement of Ta Cenc, being limited by the fault which proceeds from Imgiar ix-Xini to Xlendi, and outcrops along the coast and outlets of valleys from Ras id-Dueira and San Dimitri to Zebbug, and again at Ras il Kala and Hondok ir-Rummien. In the last two localities and at Cape San Dimitri this rock becomes very compact and crystalline, the traces of fossils being mostly obliterated, at several points becoming harder and more coloured, and takes a high polish, and is therefore known by the incorrect name of Gozo marble. The upper layer, or Etampian, of the Lower Coralline (Maltese, - *Kawwi tas-seconda*) is very much used for the production of lime (Maltese, - *hagra tal gir*) and of filtering tanks or reservoirs. It is found in all the localities above mentioned, at St. Julians;, Zabbar, Musta, and also at Wied Encita close to the road at Hattard. But this layer or Etampian takes its greater development underneath the *Globigerina* beds in the district between Zebbug, Siggiewi, Kormi and Halluka, forming a vast porous mass, dipping down to sea-level, and acquires great importance as the main seat of our deep level springs of first class potable water. In this district the white porous rock, called "White Rock" by Chadwick who was the first to recognize its importance and to prove its value by tapping its resources, lies very deeply below the *globigerina* beds, and from it nowadays, by means of deep galleries constructed at one or two feet above sea-level, we are obtaining most of our supply of potable water.

The same bed of white porous rock, with its valuable accumulation of potable water, is met with at Hamrun, Birchircara, Lia, Birzebbugia, Zejtun, Zabbar and Tarxien, wherever shafts are sunk deep enough to reach it at or about sea-level, or wherever the Lower Coralline reaches the sea-level, without forming outcrops at the surface. From the lower compact and hard layer (Sannoisian) of this formation (Maltese *Kawwi* or *Zonhor tal prima*) an excellent hard stone is obtained, more or less crystalline or flinty, very useful for paving footpaths, for breaking up into macadam as road-metal, and for the construction of docks, as well as for other works requiring great resistance to weight or to the action of the weather or of the sea.

The Lower Coralline Limestone is made essentially of the remains of calcareous Algae, Nulliporae, Florideae, and other encrusting Algae, chiefly belonging to the genera *Corallina* (hence the name of the formation), *Lithophyllum* and *Lithothamnium*, very similar to those which in present times are slowly but actually building extensive banks in many seas, like the banks and atolls which are being built up by the Corals in warmer latitudes, but of course more slowly.

In the Lower Coralline Limestone we find the remains of certain Foraminifera, namely: species of Amphistegina, the most common being *A. Lessonii* D'Orb., species of Operculina, of Orthophragmina and of Lepidocyclina. The following Echinoderms have been found chiefly in the softer upper layer, viz: *Scutella striatula* Marcel, *S. subrotunda* Leske, *Echinolampas equizonatus* Greg., *E. Kleinii* Goldf., *E. Richardii* Desmaret, *E. Tagliaferri*, *E. hemisphaericus* Lek, *Opissaster Scillae* Wright, *Hemiaster vadosus* Greg., *Clypeaster altus* Lamk. Which is very abundant, *C. marginatus* Lk., *Cydaris oligocenicus* Greg., *C. melitensis* Forbes, in gozitan marble, *Echinus Duciei* Wright, *Pygorhyncus Vassalli* Wright, as well as species of the genera *Conoclypus*, *Spatangus*, *Brissus*, *Brissopsis*, *Schizaster* etc. Among the Brachiopoda may be mentioned *Terebratulina Costae* Seg, *T. ampulla* etc. The Mollusca are represented by many species of *Pecten*, such as *P. scabrellus* Lck., and *P. bollenensis* Meyer, *Vermetus Woodi* Morch, species of *Ostrea*, *Solarium*, *Comus*, *Phorus*, *Natica*, *Cypraea* and *Lucina*, along with Cirripeds, mostly species of *balanus*. Very usually the fossils of the lower hard layer (Sannoisian of Paris) are extracted with much difficulty owing to the hard matrix in which they are embedded, and their more or less disorganized or altered condition, but in many places abound very perfect casts of Molluscs etc. Many species of Corals are also met with in both the upper and lower layers, either isolated or in groups of varying size, and often in a very good state of preservation.

The Lower Coralline Limestone is of considerable thickness. At Ta Cenc in Gozo it reaches a height of more than 120 metres above sea level. At Gargur, Musta and Zurriek the thickness is little less. According to Murray and to most modern writers, the Coralline formations, in our case both the Lower Coralline of the Oligocene and the Upper Coralline of the Upper Miocene, but in other countries other similar formations belonging to other periods, must have been formed at a depth of 20 to 50 fathoms below sea level, in an open clear sea and in a warm latitude, not far from the littoral, but far from the mouth of rivers and away from the influence of muddy deposits. At present similar species of encrusting calcareous Algae of the genera *Corallina*, *Lithothamnium* etc. can be seen continuing their constructive work along our rocky littoral at sea level, as also at varying depths down to 50 fathoms.

2. THE GLOBIGERINA FORMATION. The Globigerina Formation or Globigerina Beds (*Globigerina Limestone* of Murray, *Pectenschichten von Scio* of Fucks, often called erroneously Sandstone - *Arenaria*, - by older writers), belongs to the Lower Miocene. This formation is called Globigerina Marl or Globigerina Limestone because it contains very abundant remains of minute shells of Foraminifera belonging mostly to the genus *Globigerina*. This formation overlies the Lower Coralline Limestone and covers the greater part of the surface of both

Islands, with extensive outcrops over about two-thirds of the surface of Malta, towards the east, and over more than one half of the surface of the western part of Gozo, acquiring a great thickness in the district from Naxaro and Gargur to Birchircara and again from Curmi and Luca to Imkabba and Krendi, as well as in other parts of Malta, with a thickness of over 60 metres; but in other districts, as in the south-eastern part of Malta, at Hattard, and in some places near the coast of both Islands, becomes much thinner, and hardly exceeds 10 metres. In certain parts it alternates with thin layers of the Upper oralline, and also with layers of compact bluish marls (Maltese = *hagra cahla*), which are met with either as small or large lenticular deposits as at Hamrun and Curmi, or as deep layers extending over considerable areas as at Lia. Before Murray, this rock was known as a *Sandstone (arenaria)*, but Murray pointed out that the minute sand-like granules of which this layer is mostly formed, are in reality the small clustering shells of Foraminifera of the genus *Globigerina* which lived on the surface of the sea, and on their death their shells descended to the bottom where they gradually accumulated in such vast quantities, hence the *Globigerina Limestone* which Murray gave to this formation. Similar deposits of white calcareous ooze consisting of the shells of Foraminifera are now being accumulated over vast tracts in the Atlantic Ocean and elsewhere, at depths not exceeding 2000 fathoms. The stone which is quarried from the Maltese formation of *Globigerina* constitutes our principal building stone, called *free-stone* (Maltese=*franca*), being very easily worked. The so-called *hagra tas-soll*, belonging to the same formation, is met with in certain parts as a more compact layer, somewhat yellowish or reddish, and is also used for building purposes, but weathers badly and in a few years gradually crumbles in powder, especially if exposed to the sun and if sufficiently close to the ground to absorb moisture by capillarity. Another variation is the stone called *Karghejj*, which is whitish or yellowish, more or less abounding in casts of Annelids, and on exposure often gradually peels off in thin crusts. The bluish marly stone also met with in this formation (Maltese = *Karghejja cahla*, *hagra cahla*), is useless for construction purposes, at it rapidly breaks up into small angular pieces, and in a short time becomes a mass of powder when exposed to atmospheric action. The so-called *Hagra tar-ratba* or *hagra tal fran*, which is quarried from the same formation in certain parts of Gozo, is not used for building purposes, but is commonly used for the construction of ovens, cooking stoves and hearths. It is very easily worked and resists well to the action of fire without cracking or undergoing calcination, and is moreover an excellent stone for the construction of filtering tanks. According to Murray the *Globigerina* beds were deposited away from the coast and at a depth of 300 to 1000 fathoms, which of course means that after the preceding Oligocenic period the bottom of the sea must have undergone a considerable subsidence, although it is quite possible that the deposit could have accumulated in more shallow waters, through the action of currents, but always away from the coasts.

In these Islands, as in other countries, the *Globigerina* Beds of the Lower Miocene are divisible into two layers or substrata, iz: a lower layer or Aquitanian, so called from the ancient Aquitania in France; and an upper layer or Bordeaux layer (Burdigalian), so called from a similar deposit which exists in the district of Bordeaux in France. This upper layer is often also called Langhian from the Langhe of Piedmont. In its turn the Aquitanian layer is divisible into two zones,

namely, a lower zone made of a soft yellowish limestone with abundant remains of *Pecten* (*P. Koheni* Fucks, *P. Pasinii* Mgh. etc.) and corresponds to the *Pecten* Limestone layer of the Island of Scio; and an upper zone made of a white or whitish limestone, of a some-what crystalline structure, with remains of Echinoderms (*Schyzaster*, *Clypeaster*, *Echinolampas*). To the lower zone correspond also the bluish marly limestone of Casal Lia, rich in clayey matter and therefore almost impermeable, the hard noduliferous limestone at Hattard near the Lunatic Asylum and the compact reddish or yellowish limestones (*hagra tassoll*) of various localities. The upper zone extends broadly, and for a considerable thickness from Hattard to Balzan and along the plain to Tal Balal and Misrah Leuza in the district of Birchircara. From this zone is quarried a good building stone, white and very easily workable, but is often not very resistant to atmospheric action and is sometimes liable to peel off in crusts.

The upper layer of Globigerina Formation, the Burdigalian or Bordeaux layer, is likewise divisible into two zones. The lower zone is made of a compact limestone, somewhat yellowish, which sometimes has a semi-crystalline or even saccharoid structure, but is also easily worked, and outcrops as a very tick formation at halluka and Mkabba, especially in the district known as "Tad-Daul". This zone supplies our best building stone, which however becomes too hard and semi-crystalline, and difficult to work when quarried in places near the coast. The upper zone of the Burdigalian is made of a soft limestone, usually white, very friable and broken into small pieces called *Karghej* or *Rass*, which when it is too broken up offers an insecure foundation for buildings constructed upon it. Such broken up limestone or *Rass* is met with in various parts in both Islands and forms extensive tracts in the plain of Hemsia and Ta Kali between Notabile and Lia, as well as at St. Paul's Bay, Zebbug, near Notabile etc. in Malta, and at Wied iz-Zejt, Ghasri and Kercem in Gozo.

The lower zone of the Aquitanian, in both islands presents also two layers of so-called *nodules*. These layers varying in thickness from a few centimetres to a metre or more, are known to our quarrymen by the name of chains (*catina*), and contain many vegetable and animal fossils completely infiltrated with oxides of iron and reduced to the condition of limonite; phosphatic, calcareous or limonitic casts of Brachiopods and Molluscs, valves and shells of Molluscs and Brachiopods, teeth of Selachians (Sharks) with the enamel in an excellent state of preservation, Cirripods, and nodules of various sizes and forms known as Coprolites, and usually considered as fossilized excrements of Selachians and other marine animals. These coprolites consist in great part of tribasic phosphate of lime, and their formation appears to be really due to excrements of Selachians etc. fossilized, encrusted and infiltrated by the action of Algae, and as Algae could not have lived beyond a depth of 200 fathoms, we are led to believe that the coprolites were deposited in comparatively shallow waters. The same layers of nodules present outcrops at Bugibba (St. Paul's bay), Zabbar, Hattard, Birchircara, Marsascirocco, and still more in Gozo along the coast from Malsalforno to Zebbug and again at Xlendi near the tower, where the intense infiltration of ferric oxides points out still more clearly to the existence of a vegetation of Algae. However similar layers of nodules and other remains more or less infiltrated or wholly replaced by phosphates and ferric salts and oxides, are met with here and there also at higher levels, through the whole extent of the

Globigerina Formation.. In certain parts, such as at Bugibba, Birchircara, Siggiewi, Krendi, Hamrun, neighbourhood of Notabile, Sliema etc. there are several layers of nodules, more or less differing from each other in character, and sometimes coalescing into one thick layer but it is perhaps at Fomm ir-Rieh that the sequence of the various layers of nodules of the Globigerina beds is seen to the best advantage, owing to which the Globigerina formation has been by some subdivided into as many as nine distinct sub-layers or zones.

The red earth which is found in the fissures and pockets of the globigerina Formation is of the same good quality as that which is found in fissures pockets and seams of the Lower Coralline Limestone, but generally it has a less lively red colour, sometimes brown red or dark red, and is less retentive. The red earth of the Upper Coralline Limestone is usually of a light red colour, more loose and sandy, rather less clayey, and sometimes almost yellowish and distinctly sandy; occasionally it is dark red or blackish. The formation or existence of this red earth appears to be due to the slow action of rain water charged with atmospheric carbonic acid gas, which gradually dissolves and removes the carbonate of lime, but leaves the fine clayey matter, the phosphates of lime and the ferric oxides, which accumulate in the fissures, seams, or pockets of the rock, often in considerable masses, or are gradually carried down to the small plains or valleys at a lower level, where they accumulate as real alluvial deposits of red earth. In places where there is an outcrop of the bluish marly layer of the Aquitanian which easily breaks up and becomes reduced to powder by atmospheric action, a deposit of greyish white soil is formed, loose in texture, of inferior quality and low degree of fertility, which being calcareous, is very easily susceptible to the action of organic manures, and as easily loses it, and owing to this quality it requires frequent manurings to acquire and retain a fair condition of fertility. Where there are out-crops of the upper zone of Burdigalian, the so-called *Rass* or *Karghej*, very soft and all broken up into small fragments which are easily reduced to powder, the soil is white or cretaceous, with a high percentage of carbonate of lime and also with some clay, owing to which it is less loose and less barren than the preceding. Moreover this rock is naturally much more porous, and in its case there is not the same difficulty of stagnant moisture, usually met with wherever there are outcrops of the bluish marly bed or *hagra cahla*.

With the exception of this marly bed, all the various zones of the Globigerina formation are made of porous rocks, which absorb the water, and pass it down to lower levels as through a very fine filter, so that the rain water gradually accumulates in the lower strata of the same formation or in the white porous rock of the upper layer of the Lower Coralline.

The principal fossils which are found in our Globigerina Formation are the following:

Molars of *Mastodon angustidens* Cuv. Found in gozo at Kolla il Bajda near Malsalforno; the carcass must have been brought by currents from the mainland of Africa. *Ichthyosaurus gaudensis* Hulke, also found in Gozo; species of *Chelonia*, various Teleosteous Fishes and species of *Pycnodus*; a species of Saw-fish probably *Pristis pectinatus* found at Zebbug in Malta; many Molluscs,



species of Nautilus, *Scalardia Duciei*, species of *Cassis* and *Crania*; *Pecten flabellum* Ugolini, *P. Koheni* Fucks, *P. Pasinii* Mgh., *P. Laticosta*, *P. burdigalensis* and species of *Lucina* and *Tellina*; many casts of *Conus*, *Cypraea*, *Solarium*, *Natica* and *Phorus*; many Brachiopods and casts of Brachiopods such as *Cavolinia Audenini* Vinassa, *C. interrupta* Bonelli, *C. Cookei* Simonelli, *Vaginella Rzehaki* Kittl., *V. Calandrelli* Michelotti, *V. testudinaria* Mich, *V. depressa* Daudin, with species of *Ierebratula*, *Discotrochus* and *Stephanophyllia*; some corals as *Caryophyllia* and many Echinoderms, such as *Schyzaster Parkinsonii* Defrance and *S. Desori* Wright, *Scutella striatula* Marcel and *S. subrotunda* Leske, *Spatangus Hoffmanni* Goldf. *Brissopsis crescenticus* Wright, *Hemiaster Scillae* Wright, *H. Cotteani* Wright and *H. Gradeloupi* Desor.

3. LAYER OF BLUISH MARLS AND OF BLUISH AND YELLOWISH CLAYS. The Layer of Bluish Marls and Clays (*Badner Tegel* of Fucks, *Blue Clary* or *Marl* of Murray etc.), along with the overlying layer of green-sands, constitutes our formation of the Middle Miocene, which according to Dr. Bather of the British Museum corresponds with the Helvetian, so called from contemporary lacustrine deposits of Switzerland. The presence of certain fossils in the Blue Marls has induced De Stefani to ascribe them to the same age as the Langhian beds of Sardinia and other parts of Italy, and Fuchs considers them as equivalent to the Schlier of the Vienna basin.

The Blue Marls form outcrops and cover the surface in a few places where the Upper Coralline Limestone has disappeared, but erosion has not yet uncovered the underlying globigerina Beds. Few of such places are left, and therefore mention may be made only of the three small hills called *il Gwiedi* at *Imtahleb*, of other such small hills at *Gnejna* and near *Notabile*; and of small plains and hills or hillocks in *Gozo*, as at *Kercem*, *Ghelnus*, *Zebbug*, the district *Tal Barmil* etc. The *Merzuk* along the road to *Malsalforno* in *Gozo* is just capped by a few remaining blocks of the Upper Coralline. However, in those places where the Upper Coralline of the Upper Miocene still exists, we find the layer of Blue Marls and Clays, associated or not with the layer of Greensands, laid bare all round the foot of the cliffs in both Islands, and forms a base more or less slanting in proportion to the varying consistence of the Marls and Clays, or to the more or less efficient protection from disruption and erosion, afforded by the covering layer of the Upper Coralline, this last invariably constituting a more or less flat table-like capping to the hills.

Our Middle Miocene or Helvetian, therefore, consists of bluish or greyish marls and bluish or yellowish clays all originally deposited in the sea, and are covered by a layer of greensand, having outcrops at the base and sides of all hills and heights made of the Upper Coralline Limestone; beginning in *Malta*, at *Fawwara* proceeding to *Tal Gholja*, *Boschetto*, *Rabato*, *Notabile*, *Imtarfa* as far as *Klegha*, and thence all round the *Wardia* heights to *Ghain Tuffieha*, *Gnejna*, *Bahria* and *Imtahleb*, and back to *Fawwara*. There are also extensive outcrops at *Mistra*, *Ghain Hadid*, and again on the eastern side of *Ahrax* along the road to *Kammieh*. It appears that at *Comino* the Marls have outcrops under the sea along the extensive outcrops from *Hondok ir-Rummien* to close to *Imgiar ix-Xini*, along the valleys and coast from *Kala* to *Xaghra*, around the heights of *Rabato*, *Kercem*, *Zebbug*, *Garbo*, *Giurdan*, *Ghammar*, *Ghain Ghabdun*, *Ghar Ilma*, *Ta Harrax*, *Id-*

Dabrani etc. In certain places, such as at Zebbug in Gozo, and at Ahrax and Gneina in Malta, the Marls have a dark bluish colour, due to the presence of oxides of manganese and sulphides; and the colour of the clays underlying the Upper Coralline along the road of Migiarro close to Fort Chambray in Gozo is blackish or black, and the many fossils and casts of fossils which abound here, and have been met with in quantities in the course of construction of the drainage gallery, have a shining metallic, almost silvery coating, which appears to be due to metallic sulphides, which they soon lose when exposed for some time to the action of the atmosphere. The Marls are always more or less bluish, but the Clays may have also a yellowish colour or even ochraceous, due to a greater proportion of oxides of iron over the oxides of manganese; and both the blue and the yellow clays may contain in varying quantities lenticular yellowish crystals of sulphate of lime or gypsum, of various sizes, from 1 c.m. to about 20 c. in diameter; as well as nodules of sulphur. Such crystals are common in the clays at Imtahleb, Bahria and near Dingli in Malta, and in the clays of Zebbug etc. in Gozo. The clays contain also many organic remains, usually of small size, more or less id-organized and made limonitic by infiltration of oxides of iron, and nodules of iron pyrites more or less of crystalline texture, and of a beautiful golden yellow colour. Occasionally, pieces of lignite are also met with.

The Marls and the Clays form a layer hardly seven metres in thickness, and rarely reaching ten metres. In many points the marls disappear altogether, and then the clays never exceed four metres in thickness, and are often reduced to one metre or less. They are always present, within these varying limits, below the Upper Coralline Limestone, except on the hilly ground in the district of San Leonardo, Zabbar, between the road to Marsascala and the sea. However, the clays and the marls, broken up into a soil by the action of the atmosphere and carried by the rain down the slopes of the hills, often cover vast tracts of the Globigerina formation around the base of the hills and heights above mentioned, so that the layer of marls and clays often appears to be much thicker than it is in reality. Where these clays extend so as to form fields, the soil is deep, moist and fertile, and if properly worked will retain its moisture well into the summer for the benefit of the growth of summer field crops; and on the other hand, if not properly worked, is liable to become baked during the long droughts of our hot summers and to develop deep fissures which are dangerous to the root-system of trees. The clays, mixed with sand, and well worked, are used in the manufacture of flower-pots and other common pottery. Moreover as the marls and clays are practically impermeable, the rain water filtering through the Upper Coralline and the layer of Greensand, accumulates on the clays, and then finds out a way of exit at the sides, at the lowest level between the clays and the Upper Coralline, thus forming our natural high level springs of Fawwara, Gnien tal Iskof, Boschetto, Bahria, Imtahleb, Gnejna, Ghain Tuffieha, Wardia, Gnien ingrau, Ghain il Gbira, Ghirghenti etc. in Malta; and "tal Lunziata" Migiarro, Wied il Kasab, Gnien Xibla, Pergla etc. in Gozo. Without these perennial natural springs the Maltese Islands could not have afforded a hospitable home to the first inhabitants, and on this score it is obvious that the layer of Marls and Clays has been an important asset in our stratigraphy.

The Marls and Clays are marine deposits, and it is probable that they have been deposited in the sea at a depth not exceeding 300 fathoms, or possibly in more

shallow waters, not far from the outlet of large rivers. They are therefore of terrestrial origin, and very likely they have been formed by the clayey matter brought down by rivers from extensive and probably mountainous regions, the matter having been gradually deposited at some distance from the coast. Possibly the rivers may have derived their origin from the Saharian region of North Africa, but of course the direction of the deposits may have been influenced by the direction of the sea currents in those ages. That the sea currents must have played an important part in this deposition of clayey matter is evident from the peculiar aspect of the marls and clays in certain districts. Thus, at Zebbug and Kbajjar, at Ghelmus and Kala etc. in Gozo, and at Gneina, Ghajn Tuffieha, Bahria, Kleigha and Imtahlef in Malta, the Marls and Clays have the appearance of having been deposited in heaps, rather than in horizontal layers, and this aspect appears to point out to the long continued action of eddies in the currents, produced at no great distance from the coast. At any rate, it is clear that after the period of the Lower Miocene, the sea bottom over which our Helvetian formation was about to be deposited underwent some upheaval, and the sea became less deep, and that one or more large rivers began to pour their mud laden waters in our neighbourhood and that soon after the period when the deposition of the Marls and Clays took place, the rivers disappeared, the coast where their outlets stood, receded considerably, the sea bottom again subsided to some extent, and the waters became quite clear before the commencement of the period when our Greensand of the Helvetian or Middle Miocene began to accumulate, and finally that these conditions persisted during the subsequent period of the Upper Miocene when our Upper Coralline Limestone began to be formed, with the exception that then the sea bottom must have undergone a further upheaval which permitted again the development of encrusting calcareous Algae, thus reproducing more or less the same conditions under which the Lower Coralline Limestone was formed in the Oligocene period.

4. THE LAYER OF GREENSANDS. The Greensand (*Grunsand und Heterosteginenkalk* of Fuchs, *Greensand* of Murray, *Sabbie verdi* of Italian Authors, Maltese, - *Ramel hadrano*, *Ramel*, *Rina*), forms a covering to the Blue Marls and Clays. Usually, it consists of a thin layer, and in certain localities it is reduced to a mere seam or film, or is missing altogether. Layers of greensands similar to that of our Upper Helvetian are found in many marine formations belonging to geological epochs far more ancient than ours; and at the present times similar deposits are in process of formation in the bottom of the sea at some distance from the coast and at a depth of 200 to 1300 fathoms, in clear waters, away from the outlet of rivers, along the precipitous coasts of South Africa, as well as in other seas. In these localities are being formed greenish muds, with granules and concretions of glauconia, with much admixture of phosphate of lime, due in all probability to the slow decomposition of organic remains which are gradually deposited and go on accumulating on the sea floor.

The Greensands of our Upper Helvetian lie immediately underneath the Upper Coralline Limestone, and form a sort of filter through which the rain water percolating from the Upper Coralline passes down to accumulate on the underlying impermeable beds of Blue Marls and Clays. As already mentioned in many points the Greensands do not exist or are hardly traceable, but in other localities such as at Boschetto, Ghajn il Gbira, Bahria, Gneina, Ghajn Tuffieha,

San Martin, Wardia, Mistra, Ahrax etc. in Malta, and in many places in Gozo they form a distinct layer, often subdivided into several thin layers alternating with layers of soft Upper Coralline, and then they have the appearance of a true sandstone, usually greenish, but sometime yellowish or blackish, due to the varying colour of the granules of glauconia. At certain points it is found that the tiny layers of greenish sand alternate with similar layers of yellowish or even reddish sands, but usually the layers of yellowish or reddish sands are situated above the others, so that the layer of Greensands could be divided into two sub-layers; a lower sub-layer usually made of greenish or green sand, but sometimes made of blackish or black sand, and an upper sub-layer usually made of yellowish sand, but often made of reddish sand and sometimes of greyish sand.

The layer or layers of sand, in one or two places, have an aggregate thickness of about 12 metres, but their usual thickness is two metres or less, often reduced to a thin layer of a few centimetres, or a mere film hardly distinguishable from the lower layer of the.

5. THE UPPER CORALLINE LIMESTONE. (*Tufo Corallino Superiore*, *Calcare a Lethothamium*, *Leythakalk* of Fuchs, *Upper Coralline Limestone* of Murray and others).

The Upper Coralline Limestone, belonging to the Upper Miocene, corresponds to the Tortonian (from the Tortonese in Italy), and covers all the other strata in the western part of the Island of Malta from tal Gholja as far as Ahrax, and from Wardia to Fomm ir-Rieh. The islets of Filfola and Selmun and the island of Comino along with the islet of Cominotto consist exclusively of the Upper Coralline Limestone, which also covers the summits of the heights in Gozo, with the exception of Ta Cenc, but covers also the irregular table-like heights on which stand the villages of Xaghra, Nadur, Zebbug, and Kala, as well as the Fort of Chambrà. It is a limestone built up by encrusting calcereous Algae belonging to the genera *Lithothamnium*, *Lithophyllu*, *Corallina* and other Nulliporous Algae (Florideae), with some true Corals, either isolated or in groups or colonies of various sizes, and therefore is essentially of the same composition as the Lower Coralline Limestone and like if formed originally in the high seas, far from the outlet of rivers, at a depth of 20 to 50 fathoms, in the same manner in which similar formations are being slowly built up in the present times. This proves that after the formation of the layer of Greensand the sea floor had undergone an upheaval. Towards the close of the period of the Upper Miocene this upward movement became much more pronounced, and as a result the Maltese Islands emerged from the sea and were upheaved at least to their present height above sea level, or possibly much more than that if we were to account partly for the present configuration of the Islands by a subsequent partial subsidence during the Pleistocene period. In fact there is ample evidence to show that the emergence was on a much more extensive scale, and that the mainland of Africa became united to Sicily and Italy, transforming the Mediterranean into a western and an eastern sea, and at the same time the Mediterranean which extended as far as the plains of Persia and Afghanistan became further reduced by the emersion of the vast region east of the Levant. However, it may be pointed out that according to Nelli, the Island of Lampedusa is entirely made up of Pliocenic and Post-Pliocenic marine deposits, which of course, is a proof that the site of

that Island remained long submerged up to the beginning of the Quaternary period. In some points the Upper Coralline Limestone in our Islands reaches a thickness of 130 metres, as at Comino, but generally its thickness is only of about 40 metres or less, and in certain places it is reduced to hardly 3 metres, perhaps owing to processes of disruption and erosion. It has outcrops along the coast at St Paul's Bay, from the rocks Tal Ghazzenin around the bay as far as the islet of Selmun, along both sides of the bay of Mellieha, and all around the Ahrax as far as Cirkewa and again from Kammieh to Rdum ix-Xkuk in Malta, and for a short tract at Hondok ir-Rummien in Gozo. It also forms a sort of islet, called Gzira, unconformably contiguous with the Lower Coralline at Hagra is-Seuda near Ghar Lapsi in Malta. Another islet on which stands the Musta Fort is likewise unconformably contiguous with the Lower Coralline along the Great Fault. There is an important overlap of the Upper Coralline on the high ground to the north east of Zabbar from the neighbourhood of San Leonardo to beyond the chapel of St Nicholas, almost along the coast. Here, however, the Upper Coralline has not the usual underlying strata of Marls and Clays and of Greensand, but lies directly on the upper sub-layer of the Globigerina Beds, which has here the same character of the white broken-up, soft cretaceous upper Globigerina layer of Hemsia and St Paul's Bay.

Our Upper Coralline Limestone is divisible into three sub-layers. The lowermost consists of a white or yellowish rock mostly very soft and friable, which is easily eroded by atmospheric action, with large irregular roundish masses or nodules of a much harder rock having an almost flinty fracture. This white rock is often used for the production of lime, but at certain points, as at Ahrax, Kasam Barrani, Mellieha, Boschetto, Dingli, Bahria, etc. yields a building stone of good quality of a saccharoid or granular structure, somewhat hard to work, but resists very well to atmospheric action. The middle sub-layer consists of a yellowish or reddish rock, very hard, with many pockets and spaces filled with red earth, very similar to the "crag" of the Pliocene period, but sometimes as in certain places in Gozo, becomes very compact and hard, with a crystalline structure, and takes a high polish, and is occasionally used in ornamental work under the name of Gozo marble. The upper sub-layer is made of a white or yellowish rock, or somewhat greyish, usually hard and crystalline, also very similar to the "crag" above mentioned, spongy, with many cavities or spaces, empty or filled with red earth, but often very compact and hard, and sometimes sufficiently well coloured to be used under the name of Gozo marble. Sometimes the middle and upper sub-layers are indistinguishable, forming a mass of craggy rock more or less broken up; and in a few localities both sub-layers are reduced to a deposit of varying thickness made up of soft reddish calcareous rock very friable and mixed up with gravelly red earth, known under the name of *Torba* or *Torbass*. Such deposits of *torba*, are specially abundant in Gozo in the hilly region between Ramla and San Blas and along the Nadur-Ghainsielem road. They are met with in Malta at Ghain Zhuber near Mellieha, at Ahrax near Cirkewwa, at ic-Ciumnija near Kammieh, at Gneina etc.

It is mostly in the fissures and caverns of the Upper Coralline that we meet with those stalagmitic veins or deposits of semi-transparent or crystalline carbonate of lime, often of the thickness of half a metre or more, from which is obtained the so-called *Gozo Alabaster*, frequently found in Gozo in veins or masses

sometimes one and one half metres in diameter. It is also met with in various places in Malta, as at Selmun, Majesa, Dingli etc. In this layer are also found natural caverns or galleries with abundant stalagmites and stalagmites, such as the so-called Grotto of Calypso at Xaghra, in Gozo, discovered towards the close of last century.

From the middle and upper sub-layers of the Upper Coralline, in both Islands, is obtained a hard compact stone, useful for construction work, and for breaking up into spalls for road metalling, which according to the degree of hardness is known as *Kawwi tal prima* or *Zonkor* and *Kawwi tas-seconda*, in the same way as already mentioned in the case of the Lower Coralline. Moreover, the upper sub-layer yields a good building stone of granular texture (*hagra giulglienija*), rather easy to work, which is used for building purposes in the same manner as the freestone of the Globigerina Beds.

The following are the principal fossils of our Upper Coralline Limestone:

*Echinoderms*: Clypeaster altus Leske, var. crassicostatus Wright, C. marginatus Lek., Schizaster Scillae Desm., S. eurynotus Agass., Brissus latus Wright, B. imbricatus Wright, B. oblungus Forbes, Brissopsis Duciei Wright, Pericosmus excentricus Wright, Cidaris miletensis Forbes, Echinus Duciei Wright, Echinolampas Deshayesii Desor.

*Crustaceans*: Carapatia and chelae of various species.

*Molluscs*: Pecten Malvinae Dub., P. Pandora Desh., P. squamulosus Desh., P. Burdigalensis Desh., Spondylus quinquecostatus Desh., Ostrea Boblayei Desh., O. Virleti Desh., casts of various species of Arca, Cytherea, Voluta, haliotis, Trochus etc.

Fragments of brachiopods, and shells of brachiopods very common at Bahria; various species of Foraminifera.

6. QUATERNARY. It is not unlikely that certain conglomerates such as those at Fomm ir-Rieh and at Wied il Ghasel near St Catherine's Chapel, at Maghtab and Bahar ic-Ciaghak, near Ghain Rihana etc., may prove ultimately to be of Pliocenic origin, as land deposits which have formed shortly after the emersion of the Islands, but so far no conclusive evidence could be obtained from fossilized remains. So also, certain true sandstones, whitish or greyish, which are met with in small quantities near the various inlets at Ahrax, may at least in part, be referred to the Pliocene Postpliocenic sands and conglomerates, these last sometimes assuming the character of a true "pudding", with fossils of Mollusca (mostly terrestrial) etc., very nearly allied to or identical with living species, exist over small areas in Malta at Ahrax (near Ramla tal Bir, il Kortinl l'Armiel, ic-Circhewa and ic-Ciumnija), at the head of Melleha Bay close to the hill "il Gudia", at Bugibba, at Wied Kannotta, Ghain Rihana and Burmarrad at Marsa, and at Birzebbugia; in Gozo, at Ramla and Marsalforno. All these Postpliocenic formations are necessarily of small extent, and not always easily distinguishable. There are however, in various districts in Malta true Quaternary deposits of great importance, which may be reduced to two types, viz.

- a) Caves and large fissures with ossiferous deposits and conglomerates, and ossiferous breccias.
- b) Conglomerates and alluvial deposits in the plains and valleys.

Ossiferous caves and fissures have been discovered in various localities and have yielded quaternary fossils in abundance. The principal caves and fissures so far discovered are the following; the cave of Mellieha discovered in 1840 and explored by Captain Spratt in 1857; the Gandia fissure near Siggiewi and Imkabba explored by Dr A A Caruana in 1857, and By Dr Leith Adams in 1862; the cave of Zebbug at Wied il Gbir discovered in 1858 and explored by Captain Spratt; the cave of Maghlak, the fissure or fault of Maghlak, the fissure of Mnaidra, the fissure of Binghisa at Wied ix-Xokka near Birzebbugia, and another at San Leonardo near Zabbar, all explored by Dr Leith Adams in 1860; and 1866; the fissure of Xantin (Shanteen) at Imkabba explored by Dr Caruana in 1870; and the important cave of Ghar Dalam at Wied Dalam near San Giorgio of Birzebbugia, partly explored by Cooke in 1893, and again by various explorers, including Professor Tagliaferro and Mr Giuseppe Despett. Other ossiferous fissures at Zebbug, at Ta Xolxa near Zejtun, at Ta Sejba near Krendi, at Corradino and at Burmeghex near Imkabba, as well as a cave at Pergla iz-Zghejra near Xaghra in Gozo, have been explored by Professor N Tagliaferro from 1908 to 1914. The deposits in these caves and fissures consist mostly of various layers with much red earth and detritus from the neighbouring rocks, brought there by the action of water, and the lowermost strata with the bones and other fossils are often reduced to the state of breccia by infiltration of calcareous waters.

These caves and fissures have yielded many fossils of land animals of the Quaternary period, the more important being given in the following list:

*Mammals* *Leephas antiquus* Falc., discovered by Professor N Tagliaferro at Zebbug in 1908.

*Elephas mnaidrensis* Leith Adams.

*Elephas melitensis* Falc.

*Elephas Falconeri* Busk. These are three races of pigmy elephants, about 1½ metres high.

*Hippopotamus Pentlandi* Mayer.

*Hippopotamus minutus*.

*Hippopotamus europoeus* var. *melitensis* F. Major.

*Ursus spaeleus*.

*Ursus Arctos* var. at Ghar Dalam

*Cervus elaphus* var. *barbarus*.

*Cervus dama*.

*Myoxus melitesis*.

*Myoxus Cartei*.

*Ibex* sp.

*Arvicola Melitensis* Bate, and perhaps other species.

*Birds*: *Cygnus Falconeri* etc.

*Reptiles*: *Testudo robusta* spratt.

*Testudo robustissima* Tagliaf.

*Bufo vulgaris* L. and possibly other species.

Molar teeth of Man, of a taurodont type, described by Keith of London as belonging to Palaeolithic man, have been discovered at Ghar Dalam, by Mr. Giuseppe Despott.

It is evident that the Island of Malta reduced to its present size and resources, could not sustain such a rich fauna of pachiderms and other large mammals, and therefore it must be admitted that at least in the Pleistocene or Early Period of the Quaternary, the island was much larger in extent, and was connected with Sicily as well as with Africa, where the remains of *Elephas melitensis*, *E. Falconeri*, *Hippopotamus Pentlandi* etc. have also been found.

Alluvial quaternary deposits exist on a considerable scale at Burmarrad, Marsa, Pualet, Mistra, Ghajn Zhuber, in certain places of the basin of Fiddien, at Ghajn Tuffieha and at Mellieha (Ghadira etc). These deposits are made up mostly of a mixture of red earths and clays, in varying proportions according to the nature of the surrounding outcrops, with large or small stones more or less rounded and pebble-shaped by the action of water, but with few fossilized remains to far known. This last point required qualification; in fact as yet no extensive search has been made in our alluvial deposits, and especially in their lower strata, and it is not unlikely that important finds of animal and vegetable fossils may be met with if proper care is taken to look for them. The lowermost layer often partakes of the nature of a true conglomerate, more or less solidified by infiltration of lime-laden waters. These alluvial soils are generally deep and very fertile. Sandy lands, perhaps due to not very distinct terracing phenomena exist at Mellieha and Ramla. Alluvial deposits of smaller extent, called *Wilga* or *Wileg*, and mostly formed of red soils, exist at Bulebel near Zejtun, close to the Marsa of Zurriek, at Casal Lia, at Ta Vnezia and Ta Mlit between Lia and Musta, are similar small alluvial plains of red soil near Sannat and Xeuchia, and other more or less clayey or whitish soils at Ta hamet, near Garbo, at Ghasri etc. Small alluvial deposits of a mixed nature exist along the bed of the valleys at Xlendi, Wied il Ghanak (Ramla) Wied ir-Rihan (San Blas), and the lower reaches of the valley at Marsaforno.

The Glacial period of periods which covered with ice a great part of northern and central Europe, did not extend down to our latitude. But the lowering of temperature over a considerable part of the northern hemisphere, attended with vast accumulations of ice and the formation of immense glaciers, must have brought down our temperature to about the same as that now obtaining in northern Europe, with the result that instead of a Glacial period we had a Diluvial one, accompanied with much freezing during winter. To this freezing in winter, assisted by the heavy rainfall throughout the entire Glacial period, may be ascribed mainly the disruption and erosion of the Upper Coralline and of the underlying strata of Greensand and marls, over large areas in both Islands, with the consequent formation of valleys and ravines. At that time, the Maltese Islands were still much more extensive than at present, and the volume of water in the valleys was therefore sufficiently large to account for their formation. This view is substantiated by the fact that all around our coasts the sea bottom is most irregular, showing the same broken up appearance as the land, but more or less



masked by the silt brought down by the rains, and by the resumed and long continued action of the same encrusting calcareous Algae, which at an earlier period have built up the Upper Coralline.

The remains (molar teeth) of the Palaeolithic or Neanderthal man so far discovered at Ghar Dalam are too meagre on which to establish a theory as to the race to which he belonged. At any rate, the Palaeolithic man must have inhabited these Islands during the Glacial period, at a time when the land connection with Africa and Sicily was still in existence, and must have roamed over these southern latitudes until the end of the Glacial period, when the retreating ice, particularly before the last glacial invasion, the less intense cold, and the coming of a more genial climate permitted the migration of a more temperate Flora and a richer Fauna into Europe, and with them proceeded also the primitive man with his hunting habits. The Palaeolithic or primeval man (*Homo primigenius*, *H. Palaeolithicus*), had a brutish appearance, with somewhat bend knees and stooping gait. His skull was long, narrow and flat, and had pronounced ridges for the insertion of powerful muscles; the brain cavity was rather small but much larger than that of the apes; his forehead was ape-like, low and retreating; his eyebrows had very pronounced ridges, the eye-cavities were large and far apart, the zygomatic processes large and prominent; the nose was broad and flat; the mandible was powerful, but the teeth were large and long with taurodont roots and brutish in character, with strong and prominent canines. The arms were long, reaching to the knees; the muscles of the buttock and calf were not very pronounced, and the heel was imperfectly developed. He was very hairy, and probably both sexes were bearded. He could fling stones, and shaped flints and hard stones very roughly as missiles or as implements for the chase or for defence. He could also make pots out of clay and dry them in the sun, but he knew not how to kindle a fire or how to use it, and was unable to bake his rude clay-pots or to cook his food. He led a nomadic life and dwelt in caves or in temporary shelters, living on the produce of the chase or on such wild fruits as he could get, and did not attempt to rear domestic animals for a supply of meat or milk, or to cultivate the land for the sake of its fruits or its produce. He had no knowledge of a spiritual or divine being beyond his few immediate material needs, and whatever were his rudimentary artistic attainments, in him shone not the divine ray of an inspiring soul. In short, he had evolved the human shape, but to all appearances the shape was the only thing human about him. Later on, towards the end of the Glacial period, before he disappeared as mysteriously as he came, he had learned to cook his food and to bury his dead, possibly by contact with the Neolithic man who, there is reason to suppose, was then coeval with him, although presumable he had an independent origin.

The many megalithic monuments of the Maltese islands are referred to the Neolithic age of the late Quaternary. The Neolithic man (*Homo sapiens*, *Homo neolithicus*) the parent of the modern man, and to all purposes identical with him, adored a divinity and had a code of morals and customs. His artistic attainments were considerable and very varied. He baked his well-designed and ornamented pottery, and cooked his food. He lived in organised communities and had metaphysical leanings. He was a great builder of temples and sanctuaries, reared animals and cultivated the land, which practices of course put an end to his nomadic life. The skeletal characteristics were practically the same as with

modern man, excepting such minor details as the length of the toes and other characters specifying the various races. Very likely the Maltese Neolithic man was Libyan or "White", with a fair complexion and fair hair, with blue eyes and dolichocephalous skull. His offspring is occasionally still seen among us, here and there, in the villages. He was inured to fatigue and stood the heat better than the cold, but he was not sufficiently strong or active to ward off or withstand the inroads of the more acute and enterprising man of the Mediterranean race, who had dark hair and dark eyes, and moreover was less inured to the heat and more to the cold, and thereby showed his Caucasian or Eurasian origin.

## THE WATER SUPPLY

In the Maltese Islands there are no Artesian wells, and owing to geological reasons it is not possible to have them, except at enormous depths, and even then, their construction, in our case cannot be assisted by reliable geological directions. There are neither glaciers, nor mountains, nor lakes with their streams and rivers, and all our supply of water is due directly or indirectly to the rains which fall on the surface of these Islands. Our average annual rainfall being about 50 cm., it follows that on an aggregate area of Malta and Gozo amounting to 297 sq. kilometres, the average annual rainfall amounts to 148,500,000 cubic metres of water. Comparatively a very small portion of this water is directly received or stored into reservoirs or covered tanks to be availed of for household purposes and summer irrigation. But it is calculated that about one third of the total rainfall, or about 49,500,000 cubic metres is absorbed by the rocks and stored in the various layers. In rainy years with slow continual showers, it is probable that the absorption amounts to much more than one third of the rainfall, but the annual average of rain water absorbed by our soils and rocks may be safely estimated at 50,000,000 cubic metres, which therefore represents the sum total of our available resources. To this amount may be added at least a good third part of the water used in irrigation, which is again absorbed by the soil and rocks, and goes to join the water stored in our strata.

We have three types of springs or sources of water:

- 1) Superficial or upper level springs. 2) Deep level springs or sources, ordinarily obtained by constructing deep shafts and tunnels down to sea level or to 1 or 2 feet above sea level. 3) Wells or springs more or less superficial, or at small depth, constructed in low-lying plains, to about sea level or slightly above it.
1. UPPER LEVEL SPRINGS. These issue forth immediately below the Upper Coralline, at points where there is an outcrop of the greenlands and of the underlying layer of clays. These are real natural springs, from which the first inhabitants of these Islands obtained their water supply, and they continued as our principal water supply during summer, almost down to the last decade of last century. The rain water percolating through the Upper Coralline and the underlying layer of Greensands, accumulates on the layer of Marls and Clays which is practically impermeable, and then finds an outlet at the lowermost level of the upper surface of this layer. The volume of water yielded by each spring is dependent on the catchment area and on the annual rainfall; but it is known that after the 15<sup>th</sup> August, even before the

commencement of the autumnal rains, there is usually an increase in the yield of the springs, due probably to atmospheric action and to phenomena of intermittence, to be followed by a definite reduction of yield due to progressive reduction of storage. The water from these springs is generally potable, light and well aerated, and not too heavily laden with carbonate of lime, but it is exposed to contamination in those places where the layers of the Upper Coralline are too broken, or are not sufficiently thick to perform adequately their function as filters. The principal springs of this class are those at Fawwara, Ghirghenti, Ghain il Gbira, Boschetto, Gnien il Gbir or Gnien tal Iskof, Gheriexem, Fiddien, Imtahleb, Bahria, Gnejna, Ghain Tuffieha, Wardia, Gnien Ingrau, Imgiebah, etc, in Malta; and Tal-Lunziata, Gnien Xibla, Pergla, Wied il-Kasab, Wied ir-Rihan and Migiarro in Gozo.

Practically all over the area of the Upper Coralline (except at San Leonaro, near Zabbar, where the underlying layer of clays is missing), but especially wherever the conformation of the rocks points to a depression in the layers; or at the formation of a sort of basin where one may expect to find an important accumulation of water, shafts are constructed into the Upper Coralline reaching down to the clays; and then if, as usually happens, a flow of water is met with, the lower end of the shaft is enlarged, and the clay is partly also excavated, in order to form a sump (Maltese - *hazziena*), more or less large according to circumstances and requirements, in which the water accumulates and is afterwards carried up periodically or when required, by means of *norie*, pumps, or other appliances, for irrigation purposes.

2. DEEP LEVEL SPRINGS, OR RATHER DEEP WELLS OR GALLERIES CONTAINING SPRINGS. The rain water which falls on those extensive areas in both Islands where there are outcrops of the Globigerina Formation and of the underlying Lower Coralline Limestone, that is on over two-thirds of the surface of Malta, and on about the same area in Gozo, is absorbed by the rock in varying proportion, percolates through the strata and accumulates in the lowermost layer of the same Globigerina Formation and in the upper layer of the Lower Coralline, the porous "White Rock" of Chadwick. The rain water accumulating in these lower strata displaces partly the sea water with which the rocks at sea level are permeated, so that the accumulation of rain water of fresh water extends to about half a metre, or perhaps more, below sea level, but lower down the fresh water becomes mixed up with the sea water into a more or less brackish mixture. This mixing of fresh with sea water takes place with greater facility in such localities where owing to the presence of deep fissures or faults there is an easier or perhaps direct communication with the sea. Therefore by sinking a shaft in the Globigerina Formation, sufficiently deep to reach to about half a metre above sea level, the fissures which are met with at that depth yield a more or less abundant spring of potable water; and if no fissures are met with, horizontal galleries may be constructed at that level, and an oozing or flow of water is obtained, more or less copious according to the length of the gallery. This is what Mr Chadwick has done by the construction of the deep galleries into the porous "White Rock" which extends underneath the Globigerina Formation from Wied is-Seuda near Hattard, through Curmi and Zebbug, to Wied il-Gbir near Armiel. At present, from these deep level spring we are pumping up our most

important supply of potable water, free from any trace of contamination, although perhaps not sufficiently aerated, and rather heavily charged with lime. The water obtained from the well at San Antonio Gardens, sunk by Mr Chadwick, in identical conditions, is somewhat brackish, due probably to the presence of deep fissures, which in that locality are seen also on the surface. Similar wells sunk lately to obtain water for irrigation now exist at Hemsia, Lia, Birchircara, Hamrun, Curmi etc. The supply of water obtained from these deep springs is more or less uniform in volume throughout the year, the accumulation of water having been going on for many years, and therefore the supply is not dependent on the rainfall of one particular year, but on the average annual rainfall of some years.

3. SOURCES OR WELLS IN LOW-LYING PLAINS, AND MORE OR LESS SUPERFICIAL. These exist in the low-lying plains and in the valleys, particularly at the head of the various harbours or inlets, as at Burmarrad, Ghain Rihana, Melleha, Manicata, Ghain Tuffieha, Mistra, Marsa, Gurmi, Xlendi, Ramla and Marsalforno. In such places the rain water absorbed by the soil accumulates in the strata at sea level, and is reached by means of shafts only a few metres deep. These waters are usually flat and heavy to the taste, and contain much mineral matter (chlorides and carbonates), owing to the proximity of the sea and to the low-lying character of the land, inadequately drained and often with stagnant moisture. Moreover such waters often contain organic matter, the thickness of the layers through which the water has percolated not being sufficient to act as an efficient filter; but although generally unfit for drinking purposes, this class of water is mostly suitable for irrigation. Of course, when the proportion of chlorides and carbonates held in solution is excessive, the water may be injurious to certain plants, the strawberry plants, the small fruits and other Rosaceous trees being easily affected by an excess of chlorides; and such plants as Aubergines, Gourds, Kohl-rabi etc. may develop a rough growth, associated with a more or less bitterish flavour. It may be pointed out that a large proportion of the water thus used for irrigation is absorbed again by the soil and finds its way back to the lower strata, so that the water-supply remains more or less uniform throughout the summer, and is not liable to reduction on the same scale as is the case with the high level springs which flow between the layer of Clays and the Upper Coralline.

### III

#### THE CLIMATE IN REFERENCE TO VEGETATION

Prof. Trouessart in *La Distribution Géographique de Animaux*, dealing with the influence of the distribution of rain on the distribution of organisms, divided the surface of the globe into nine hygrometric zones, viz: the equatorial zone and four zones on each side of it. In the *equatorial zone* which is the zone of the equatorial forests, the rainfall is from 1 m. to 2 m. or more, with two seasons of rainfall alternating with periods of drought, and with a purely tropical flora. The next zones on both sides of the equatorial are the north and the south intertropical zones, in which the average annual rainfall is below 25cm, and are therefore the zones of deserts, with a tropical xerophytic flora and scanty

vegetation. The next zones in the northern hemisphere is the *north sub tropical zone* with an annual rainfall of from 25 to 60 cm. To this zone, in the southern hemisphere, corresponds the *south sub tropical zone* with a rainfall of 30 to 90 cm. These are the zones of sub-tropical vegetation and steppes, having the four seasons well marked out, with a wintry or rainy season, a spring or flowering season, a long summer of period of heat and drought, and a comparatively short autumn, which owing to the commencement of rains when the weather is still warm, is comparable to a second spring with an almost general reawakening of vegetation. The next zone in the northern hemisphere is the *north temperate zone*, with an annual rainfall of 60cm to 1 m. This is the zone of the northern forests, to which in the southern hemisphere corresponds the *south temperate zone*, the zone of the southern forests, with an annual rainfall of 90 cm to 150 cm. The greater rainfall in the sub tropical and temperate zones of the southern hemisphere is attributed to the greater extent of the southern oceans, which is necessarily attended with more abundant evaporation and consequently with greater precipitation. In the *arctic zone* of the tundras and frozen deserts and in the *antarctic zone* of desertic icefields rain is practically superseded by snow, with a short dry and somewhat warm summer, and almost continuous daylight, and a long sunless dreary winter of snowstorms and cold.

The Maltese Islands are situated in the central part of the northern sub tropical zone, and therefore we have to put up normally with a deficient rainfall, and too often the deficiency becomes a real scarcity, with its attendant evils. But for the fact that we are situated in the middle of the Mediterranean and surrounded by large sheets of water, with no near obstacles to check or divert the currents of air, the rainfall would have been much more desultory or irregular. Accordingly our rainfall is practically the same obtaining over the southern part of the Mediterranean from Sicily to the shores of Libya and from southern Spain to the Levant, the incidence of more or less rain being mostly accidental in one part of another of his region, and dependent on the more or less heat of the preceding summer and on the varying courses of atmospheric currents. Owing to the circumstances just mentioned, our rainfall though comparatively scanty, is generally very well distributed. The rainy season commences normally towards the beginning of October, and the months of October, November and December are usually the wet months of the year. The weather is usually less wet in January and February, and rain falls at longer intervals in March and April. Fortunately, good showers of rain in March and April are by no means rare, and rain being then most beneficial to the ripening field crops, these passing showers are greatly appreciated by agriculturists. After April, good showers of rain become rare, and when they come, they bring about what may be called a "green summer", as owing to storage of moisture in the soil, farmers set out with alacrity to benefit from the circumstance, by extending considerably their sowings of dry-farmed summer crops, such as cotton, maize, tomatoes, sesame etc. Rain is rare in May and September, and is exceptional in June, July and August. The average annual rainfall, usually calculated from the 1<sup>st</sup> September, amounts to 50 cm., but is sometimes as low as 30 cm, and rarely reaches 75 cm. The distribution, as stated, is generally good; but it sometimes happens that there is a heavy downpour in October or November, with very little more rain for the rest of the rainy season; or as a rare exception the rainfall in February or March, may practically equal that for the rest of the year. However, notwithstanding the

scanty rainfall good field crops are generally obtained without any irrigation, owing in great measure to the retentive nature of the soil, whether red or clayey, and owing also to the moist and porous rock which absorbs the rain and partly yields it back when most required, these two conditions permitting the development of a laborious but excellent system of dry-farming which has been practised to perfection by our farmers since a remote period of our history.

In particularly hot years the temperature occasionally reaches 35°C, for a few days in summer (in July or August); the ordinary summer temperature from June to September usually varying from 24 to 30°C. In the spring months (April - June), and again the autumn (October - November), the temperature usually varies from 18 to 24°C. In the winter months (December, January and February) the temperature varies from 12 to 18°C; occasionally it goes down to 10° or 8° for a few days in January or February. In March the sun becomes warmer, but the temperature may sometimes be as low as in February particularly in the mornings and evenings. Changes of temperature are never sudden, and the thermometer never marks any great difference between the day and night. Very rarely on small pools in exposed situations a thin sheet of ice is formed in the early morning, with a clear sky and a northern breeze blowing, but snow is unknown, or a momentary fall of particles of snow or sleet, which soon melt away, may be noticed on exceptionally cold days with stormy weather. The temperature is therefore very equable, owing chiefly to the moderating influence of the neighbourhood of the sea. In the months of January and February, and sometimes also in March there may be a few days of calm frosty weather, associated with a clear sky. Such frost develops in the morning towards sunrise and may cause injury to certain field crops, such as early potatoes, *sulla* etc. Orange-trees occasionally suffer slightly from frost, but no other tree commonly cultivated appears to be ever appreciably affected. Showers of hail, usually the result of storms with electric discharges, are not frequent, but may happen at any time from October to April, and the hail is usually less than 1 cm in diameter. On very rare occasions it has a diameter of 1 to 2 cm. Or more, and then of course it causes serious injury to vegetation, particularly to growing crops and to fruit trees.

In the summer months, and sometimes as early as May or as late as October, there are often spells of warm, sultry and moist weather, with calms or with a southern breeze. Occasionally in summer, there is a lively hot south-west or south-east wind, blowing across the sea from the heated Saharan regions, and it gives the burning sensation of a current of air proceeding from a furnace. These hot currents, if the wind happens to be blowing from the south west are also very dry, and are therefore injurious to vegetation especially to Orange-trees, the leaves becoming rolled up and parched, and drop off after a few days; or the wind may be blowing from the east or south-east and is then well charged with moisture, and transpiration from the leaves is practically at a standstill, and then no such immediate injury is noticeable. But should there be a sudden change to a northern or dry wind, then the absorption from the roots become abruptly insufficient to cope with the leaf transpiration awakened to sudden energy, the leaves flag and roll up, and soon dry and drop off. These phenomena are familiar to our farmers under the name of *Lupa* or *Lehrick*, and sometimes occur more than once during the summer, being particularly injurious when they

happen at a time when plants or trees are also suffering from a deficiency of moisture in the soil.

Therefore, in these Islands as in other lands of the same zone, although leaf-shedding trees and shrubs lose their foliage in autumn in the same way as in higher latitudes, the first autumnal rains mark a general awakening of vegetation; all spring-flowering annuals and biennials, and most of the perennials, germinate at this time of the year, and the fields, valleys, ravines etc. soon become clad with green, after the long drought and desert-like aspect of summer. Summer flowering annuals and perennials, with a summer vegetative period, of course germinate in spring, as soon as the weather becomes decidedly warmer, but both the number of species and that of individuals is limited, owing chiefly the condition of the surface layer of the soil, as in fact the land not being subjected to much tillage during the summer months, the plants would have a better chance to grow without much interference. Summer plants which do not stand a prolonged drought, can be found only on irrigated land or along streamlets in certain valleys and therefore this interesting portion of our Flora is rather scanty. Perennial water-plants are very few, and gradually disappearing, but there is a compensating abundance of perennial rock-plants which are the ornament of our valleys and rocky places throughout the spring.

Our calcareous rocks, more or less porous and moist, and the retentive nature of most of our soils, have a notable influence on the vegetation, and do modify to some extent the relations which naturally exist between the climate and plant life. Many summer plants which in other regions with different telluric conditions, would succumb to the long drought of our summer, here grow very well owing to the moisture retained in the soil, and still more owing to the natural moisture stored in the rock, over the surface of which the roots spread out to obtain the moisture which they cannot find in the shallow and dry soil. This is particularly noticeable all over the Upper Coralline, and to a less extent over the Globigerina Formation wherever the thin hard crust which has formed through long ages on the surface of the rock by the deposition of carbonate of lime held in solution in rain water, has been scratched or partly broken off purposely by human agency, in the ordinary process of land reclamation, in order to tap the moisture of the rock and make it accessible to the roots.

Our vegetation is therefore mainly subtropical in character, although in winter there is little to distinguish it from that of other countries in the south of Europe, except perhaps in the comparative earliness of the flowering period. Many tropical plants and trees do well in the more sheltered places, and only show the effects of the winter temperature in early spring, when as a rule they take a longer time to start active growth than subtropical plants and trees. In fact, the vegetation of tropical plants is regulated mainly by two short seasons of drought and comparative rest, alternating with two seasons of rainy weather and active growth, so that by partially eliminating the dry seasons by making arrangements for periodical irrigation, growth continues unchecked practically all the year. In our zone, however, the warm season coincides with a long period of drought, and the rainy season coincides with a period of falling temperature. The period of drought can be modified by periodical irrigation throughout the summer; but when towards the close of autumn the thermometer goes down to 20°C., the

growth of tropical plants such as the Banana etc., is slowed down, and ceases altogether at 15°C. although there is then no lack of moisture in the soil. Growth starts again towards the end of April, with a temperature of 20°C., and becomes more active with warmer weather. The check of growth due to the cold of the winter months, although unjurious to the flowering and fruiting capacity, would not be dangerous to the existence of the plants, but for the fact that the temperature may occasionally go down to 8°C or even lower, and those few days of excessive cold are too much for the more easily affected tropical plants such as the Mango, the Mangosteen, the Durian, the Coconut, the Cocoa tree, the Coffee plant, the Papaw, the Tamarind, the *Poinciana regia* etc. which invariably succumb in early spring, when they appear to have passed successfully through the ordeal of winter.

#### IV

#### ASPECTS OF THE MALTESE FLORA

From the foregoing pages it is evident that as our rocks and soils are eminently calcareous, and all our spring water is more or less charged with lime, plants which dislike lime and require a siliceous soil cannot be expected to thrive in these Islands. Therefore, apart from other considerations, many Conifers which dislike a calcareous soil, many Oaks such as the Cork-oak (*Quercus Suber*) etc, the Chestnut (*Castanea vesca*), the Lime trees (*Tilia*), the Horse Chestnut (*Aesculus Hippocastanum*), the Birch (*Fagus silvatica*), many species of Eucalyptus and other Myrtaceae, the Azaleas and Rhododendrons, most species of Erica etc. cannot thrive well with us, and at best can only drag a sickly and precarious existence for a few years. Such exceptions as the native *Pinus halepensis*, *Callitris articulata*, *Erica multiflora*, *Myrtus communis* etc. are able to tolerate a high percentage of lime, and therefore grow on calcareous soils almost as well as on siliceous soils, but even these suffer more or less severely when planted in the very friable and highly calcareous whitish soils of the upper beds of the Globigerina formation, such soils often containing as much as 90 per cent or more of carbonate of lime, in its worst form, that is easily soluble in water, which thus becomes highly charged with lime. On the other hand, in those localities where there are outcrops of the Lower Coralline or of the Upper Coralline, generally with a crystalline or semi-crystalline structure, and therefore although highly calcareous, are not easily soluble in water, plants which do not utterly dislike lime, have a chance to grow, provided that there is no stagnant moisture which may become dangerously charged with lime.

These are also no high mountains where an Alpine Flora could subsist. We have many rock plants but not a single species which can be described as really alpine in character, although the same rock plants or others nearly allied to them are met with on the mountainous districts of Sicily and Southern Italy. It is more than probable that throughout the Quaternary period and the Neolithic age, and down to the first centuries of the Christian era considerable tracts of land, at least in the more hilly places, were covered with forests of the same character as those now existing in the mountain regions of North Africa. The relicts of these forests must have been destroyed in comparatively modern times, and a few of them are still in existence, rather as living fossils to attest to a former exuberant



vegetation at a time when the Islands were far less densely peopled, when cultivation was not yet carried up to the tops of the hills and down into the ravines and precipitous cliffs, and the goat had not yet become so ubiquitous and the havoc caused by it so obtrusive. The soils rich in humus of Rabat amid Imtarfa, Tarxien, and other places, point out to the existence of forests or holy groves around the ancient temples or sanctuaries; and the many toponymical names, as Balluf, Balluta (Evergreen Oak), Wied il Luk (White Poplar), Wied Znuber, Ghain Znuber (Pine-tree), Ghar-ghar, Gharghur, (*Callitris articulata*) etc. point out to the existence of such trees in those localities. Every Pine-tree (*Pinus halepensis*) has long ago disappeared from Wied Znuber and Ghain Znuber, but it is supposed that the very ancient Pine-tree existing in San Antonio Gardens close to the Palace, as well as the group of less ancient Pine-trees close to the lower entrance of the same gardens, and other trees of the same species which exist or existed in the gardens at Floriana, are the remnants of the trees which formerly existed at Ghain Znuber close to Melleha, and from these were reared the many Pine-trees now existing in the Verdala Park, Boschetto and elsewhere. At Ballut tal-Wardina there are still several magnificent Evergreen Oaks of enormous size which must be at least 800 years old, besides many younger ones, and are really a national monument of no small importance. The whole district as far as Ballut ta Ghain Tuffieha must have been within historic times a large forest of Evergreen Oaks. At Imgiebah near Selmun, there are eight large Evergreen Oaks of great antiquity, and groups of these trees still exist at Boschetto and on the opposite hill called *il Bosc*, where there are many smaller trees of this species, often arising from a common base, and thus showing that they are suckers thrown up from the stumps of former large trees. As the name shows, the whole hill *il Bosc* was a forest of Evergreen Oaks, which was enclosed by the Grand Masters of the Order of St. John and reduced into a park for deer. Stumps and coppice of Evergreen Oaks exist also at Wied Hazrun close to Imtahleb, the relicts of a small but flourishing forest which was cut down at no distant date, to obtain supplies of firewood, and timber for handles of agricultural implements.

There are still a few specimens of *Callitris articulata* at Makluba near Krendi, and on the rocky precipitous sides of Wied Filep near Musta iron-bridge, as well as at ghain Rihana; but this interesting Conifer which is common in North Africa and also in Southern Spain, must have been quite common in Malta down to historical times. Its Maltese name *Ghar-ghar*, is given to several localities where it was formerly abundant, probably forming thickets like those of the Atlas mountains. The two old trees of this species now existing at San Antonio Gardens, and another one which formerly existed in the Governor's Private Gardens, are said to have been brought there from Makluba, and the younger trees existing at Boschetto etc are seedlings reared from the trees at San Antonio.

The Carob-tree (*Ceratonia Siliqua*) is a true native of these Islands, and the wild plants, as well as the seedlings sown on the spot purposely by the grower, are generally budded with good commercial sorts. The cultivation of the carob-tree was greatly extended on rocky ground during the first half of the nineteenth century, and the tree was also much more commonly grown in the eastern district of Malta from Hal-Luka to Krendi and Birzebbugia. But the destruction of

this valuable tree has been going on for many year, with occasional recrudescences whenever firewood happens to unusually dear, the destruction assuming alarming proportions in the years 1917-21 owing to the dearth of firewood occasioned by the Great War, until it was effectually stopped by government action, when the destruction or hard pruning of carob-trees without due licence, was subjected to a heavy fine or imprisonment. It is supposed that during that period from 10,000 to 15,000 trees have been destroyed to meet the demand for firewood. Our landscape is more or less dotted with the dark green foliage of this tree, and but for it our country side would present an aspect of dreary barrenness for a considerable part of the year.

The Elm (*Ulmus campestris*) grows in the valleys of Ghirghenti, Ghain il Ghira, Boschetto etc., and the White Poplar (*Populus alba*) grows at Bahria, Ghain il Gbira, Boschetto and elsewhere, whence many of the Poplars and Elms existing in the plantations of Malta and Gozo have been obtained, chiefly as grown up suckers. A few Willows, *Salix pedicellata*, *Salix fragilis*, *Salix alba*, grow here and there in moist valleys in Malta. The wild pear (*Pirus communis* and its var: *amygdaliformis*) is met with in some valleys, especially at San Martin. The Azarole (*Crataegus Azorolus*) formerly frequent in many valleys, is now met with at Wardia, Wied il Gbir, and in a few other places; but the Hawthorn (*Crataegus Oxyacantha*) is still frequent or common in many valleys and ravines. The Almond (*Prunus Amygdalus*) grows native or naturalised in many places, and the Prickly-pear (*Opuntia Ficus-indica*), is naturalised here and there, particularly on the rocky sides of the Xlendi Valley in Gozo. *Tamarix gallica*, is a true native, and grows on sandy beaches and in valleys, although now greatly reduced in numbers; and *Vitex Agnus-castus* is another native shrub which grows in valleys and sea-side places in Gozo and Comino, but is rare in Malta. It is frequently cultivated in Gozo for wicker-work. The Fig-tree (*Ficus Carica* and var: *Caprificus*) is another true native, and the Vine (*Vitis vinifera*) is another native or has been naturalised at a very remote period. The bay-tree (*Laurus nobilis*) has long existed wild or half wild, and the Olive-tree (*Olea europea*) if not a true native, has been cultivated for ages and is quite naturalised, the wild forms usually retaining a low bushy habit.

The presence of a certain amount of silica in the soil is important for the proper development of many plants. Thus most grasses contain silica in the outer structure of the haulms, and the same remark holds good as regards the stems and leaves of many other plants. Silica is absent from our geological formations, except as rather rare nodules or cherts mostly in the Globigerina beds. But it is usual in the month of April, and sometimes in March or May, to have two or three days of a southern wind, coming from the direction of the Saharan desert, when the sky becomes dense and overcast, of a yellowish or reddish hue, with clouds of very fine siliceous sand, which is deposited on the ground as a thin film, but often to a thickness of 1 mm. Or more; and if accompanied with rain we have what is popularly known as "rain of red-earth", possibly the so-called "rain of blood" of ancient writers. This annual contribution of silica from the Sahara appears to be quite sufficient to make up for any natural deficiency of this material in our soils.

Perennial water-plants are very scarce and their number tends to decrease progressively, as the spring water which formerly went to form pools along the valleys, at present there is no spring water which is allowed to run to waste. *Cyperus Papyrus* has disappeared from the Gneina valley, and *Sparganium erectum* has disappeared or is disappearing from the Ghirghenti valley. *Typha angustifolia*, is still present in the Gneina valley, but *Typha latifolia* is becoming greatly reduced both in this valley, and at Bahria etc. where it was fairly common. *Scirpus lacuster*, species of *Heleocharis*, *Apium stoloniferum*, *Nasturtium officinale*, certain species of *Carex*, *Alisma*, *Plantago-aquatica*, etc. have survived in several localities owing to their resting period in summer, which enable them to resist to a fairly long period of drought. On the other hand, annual pond plants are frequent during winter and spring in the pools along the valleys, or in the pockets and depressions on the outcrops of the Lower Coralline and on the Upper Coralline. These pockets and depressions, where the rock is very compact and almost impermeable, retain the rain water and become small pools where water-plants can thrive. In these pools we find *Ranunculus aquatilis*, var: *diversifolius* and var: *fluitans*, *R. ophioglossifolius*, *Elatine Hydropiper*, *Bulliardia Vaillantii*, *Zannichellia palustris*, *Callitriche palustris*, *Damasonium Alisma*, *Cyperus fuscus*, *Polygonum minus*, species of *Juncus*, *Isoetes*, *Chara*, *Nitella*, etc. and various fresh-water and brackish-water plants such as *Ruppia maritima* var. *rostellata* etc.

We have a certain number of halophilous or alkali - loving plants which constitute our sea-side Flora, and are rarely or never found inland. Some of these are rock-plants, and live mostly in the fissures of rocks or on rocky ground, such as *Inula crithmoides*, *rithmum maritimum*, *Crucianella maritima*, *Claucium luteum*, *Salicornia herbacea*, *S. fruticosa*, *Statice minuta*, species of *Sueda* etc; other live among stones or in low-lying places, such as *Salsola Soda*, *S. Kali* var. *Tragus*, *S. cermiculata*, *Silene sedoides*, *Frankenia pulverulenta*, *Crypsis aculeata*, *Anthemis incrassata* and its var. *Urvilleana* etc; others live on sandy beaches just out of the reach of the waves, such as *Pancratium maritimum*, *Psamma arenaria*, *Euphorbia Peplus*, *Polygonum maritimum*, *Ambrosia maritima*, *Atriplex hastatum*, *Eryngium maritimum*, *Euphorbia Paralias* etc. *Lygeum Spartum* is a sea-side plant which lives in dryer declivities facing the sea.

Our rock flora, as one would expect, is rich and varied, including such species as *Cistus crispus*, *Helianthemum arabicum*, *H. thymifolium*, *Anthyllis Hermanniae*, *A. Vulneraria*, *Medicago lupulina*, *Lotus creticus*, *L. corniculatus*, *Thymus capitatus*, *Calamintha Nepeta*, *Stachys hirta*, *Sideritis romana*, *Phlomis fruticosa*, *Anagyris foetida*, *Prasium Majus*, *Teucrium flavum*, *Teucrium oleoides*, *Erica multiflora*, *Antirrhinum majus*, *A. siculum*, *Matthiola incana*, *M. sinuata*, *M. tricuspidata*, *Centranthus macrosiphon*, *Centaurea crassifolia*, *Clematis cirrhosa*, *Ferula communis*, *Convolvulus althaeoides* and its varieties, *C. oleaeifolius*, *C. Lineatus*, *C. Cantabrica*, *Salvia officinalis*, *Putoria calabrica*, *Periploca levigata*, *Alyssum maritimum*, *Conyza saxatilis*, *C. ambigua*, species of terrestrial Orchids etc. Many of these plants are suitable for cultivation in rock gardens, and some of them such as *Erica multiflora*, *Phlomis fruticosa*, *Teucrium flavum*, *t. oleoides*, *Prasium majus*, *Cistus crispus*, *Salvia officinalis*, *Antirrhinum majus*, *Centranthus macrosiphon*, *Centaurea crassifolia* etc. are now frequently made use of for this purpose.

But on the whole our Flora is necessarily of a xerophilous character, and includes many plants both perennial and annual, which are able to tolerate long periods of drought. The perennials have mostly deep fleshy roots by which they penetrate deep enough to reach the somewhat moist lower layers of the soil, or the moist rock itself, and as they have a definite resting period which coincides with the dry season, in which they draw but little from the reserve of material contained in their roots, they are thus enabled to start growth with renewed vigour as soon as the first rains have moistened the upper layers of the soil, and induced a renewed growth of superficial rootlets, and active vegetation is started immediately. Thus we see *Colchicum Bertolonii*, *Crocus longiflorus*, and *Scilla autumnalis* show their pretty flowers in a few days after the first rains, and the Orchid *Spiranthes spiralis* is already in flower with the first slight shower towards the close of September or in October. The very common Buttercup *Ranunculus bullatus* develops its tiny foliage closely applied to the ground, and its golden flowers in their myriads impart a yellowish hue to the earth-works of the fortifications and to every bit of waste ground. The Dandelion which had been slumbering along the dusty roads, throws up at once the new foliage and the yellow flower-heads, and so on for many other species. Some of these xerophilous plants have a habit of flowering towards the end of the resting period, but before any rain has come to break the long drought of summer. In this case, however, we find that the flower-bud has been formed before the cessation of active vegetation and the denudation of the foliage in summer, so that the longer and cooler nights of late summer and early autumn are able to induce the perennial deep fleshy roots to a more active absorption of moisture from the lower layers of the soil from the rock itself. This is the case with such plants as *Urginea maritima*, the common Squill, which flowers towards the close of August or early in September, and *Carlina gummifera*, which produces its large purple heads almost at ground level in September-October, quite independently of the advent rain.

At any rate, apart from the summer annual plants, such as *Inula graveolens*, *Linaria commutata*, *L. Elatine*, *L. spuria*, *Heliotropium europaeum*, *H. supinum*, *Crozophora tinctoria*, *Euphorbia Chamaesyce*, *E. maculata* and a few other annuals which thrive in the warmest and driest period of the year, it is only along the streamlets of valleys or along the water-courses of irrigation works, that in summer we meet with vestiges of active vegetation. But these favoured localities will well repay a visit in summer, as they afford a glimpse of the type of summer vegetation with which we would be more familiar but for the almost total absence of water. In fact, along these streamlets we find then in abundance *Lythrum Graefferi* and its var. *Preslii*, *L. Hyssopifolia*, *Polygonum minus* var. *serrulatum*, *P. lapathifolium*, *P. Convolvulus*, *Pulicaria dysentherica*, *Epilobium tetragonum* and its var. *Tournefortii*, and more rarely *E. parviflorum* and *E. roseum*, *Samolus Valerandi*, *Alisma Plantago-aquatica*, *Colocasia antiquorum*, *Typha latifolia*, *T. angustifolia*, *Amarantus albus*, *A. Blitum*, *A. deflexus*, *A. caudatus*, *Panicum repens*, *P. Crus-galli*, *P. colonum*, *Convolvulus sepium*, *Mentha aquatica*, *M. rotundifolia*, *Melissa officinalis*, *Scrophularia aquatica* etc.

The Flora of the fields, although apparently of a more or less uniform type, often presents remarkable variations, which are closely connected with the nature of

the soil. Thus *Silene sericea* is always associated with shallow and poor soils; so is also *Rumex Bucephalophorus*. *Silene vespertina* is usually met with on whitish and loose soils. On moist soils we are sure to find *Convolvulus arvensis* and, in summer, *Euphorbia chamaesyce*, *Hypericum crispum*, *H. tomentosum* etc. *Urtica pilulifera*, is peculiar to rubbish heaps and odd corners. *Trifolium spumosum* and *T. resupinatum* are typical of moist and clayey lands in open situations. *Anthyllis Vulneraria* and *Trifolium nigrescens* grow in dryer localities. *Asparagus aphyllus*, *Smilax aspera* and *rubus fruticosus* are found along stone walls and in stony places. *Acanthus mollis*, *Cerinthe aspera*, *Smyrniolus Olusatrum* are shade loving plants, and *Pistacia Lentiscus* generally refuses to grow except in the rich red soils of the clefts and pockets of the Upper and Lower Coralline where the rock is naturally moist. *Bellis annua* is characteristic of shallow soils and exposed situations, and *Anchusa italica* and *Erythrea spicata* prefer clayey or whitish soil.

The Mediterranean Region properly so called, should include the entire basin of the Mediterranean and therefore apart from a varied Alpine Flora, should include the vegetation of the basins of the Rhone and the Danube, the basins of the southern Russian rivers except the Volga, the whole of Asia Minor west of the Caucasus, as well as the howl basin of the Nile with the purely tropical flora of Central Africa. But it is clear that extended to such limits, the Mediterranean Flora would cease to present that unity and those well-marked aspects which are its distinguishing features. It is already almost too much to include the Flora of both the Western and eastern Mediterranean in the same region, but for our purpose we must give to this region the meaning which is popularly ascribed to it in common parlance, independently in part of geographical and other considerations. Thus the Mediterranean Region is made to include the whole of the Iberian Peninsula, southern France, the Alps and the whole of Italy, the Balkan Peninsula from Istria to the Bosphorus, Asia Minor as far as the Taurus Mountains, the whole of Syria and Palestine, Egypt proper, the whole of North Africa as far as the desert hinterland, and of course all the Islands of the Mediterranean. This vast region may be divided into two main sub-regions, the Eastern and the Western, each with a characteristic Flora, although of course there is considerable over-lapping on many points, and the Flora of both sub-regions may be further sub-divided into sub-regional or territorial floras, differing from each other mainly on account of the various conditions of climate, altitudde soil. Italy and her Islands, owing to their geographical position have aflora which partakes of the nature of those of both the Western and the Eastern Mediterranean region, but is principally western in its features, and owing to the orography of the country, as well as to its long stretch in longitude, has a Flora notably rich and varied. Consequently the Flora of Italy may be described as the richest of the whol Mediterranean region, and indeed of Europe. Of course immigrants and naturalised plants are frequent in a land which has been the cradle of civilization, the seat of empires, and the central meeting ground of commercial routes for long ages, but the wealth of its Flora consists not in immigrants, but in the great number and variety of the native species.

With the exception of some species which are practically cosmopolitan, the flora of the Maltese Islands is definitely Italian in character; indeed there are very few species which are not found also in Sicily and in the Italian Peninsula. *Centaurea*

*crassifolia* is of course endemic and special to the Maltese Islands. *Melitella pusilla* has been doubtfully found on the African mainland, and *Callitris articulata* is also an African species. *Jasonia glutinosa* is found in Lampedusa, in the Iberian Peninsula and in Southern France, and certain varieties and forms are special to these Islands and to the Islands of Lampedusa and Linosa which are really African Islands. *Cynomorium coccineum*, known to the ancients under the misnomer of *Fungus melitensis*, and formerly reported only from the Maltese Islands, is found also in Tunisia, Sicily, Crete, and other localities of the Mediterranean, as well as in Persia and in the Canaries. *Crucianella stylosa* of Malta and Lampedusa, is also found in Egypt. Comparatively recent immigrants, such as *Enarthrocarpus pterocarpus* and *Plantago stricta* are natives of North Africa, and there are of course recent immigrants hailing from the South of Europe.

However, although our Flora is so definitely Italian and is rightly included in the Flora of Italy, there is little doubt that in the Pliocene and Postpliocene periods it was largely African in character, owing to the migration through the direct land connection with Africa. Palaeotypical species, such as *Centaurea crassifolia*, *Melitella pusilla*, *Callitris articulata*, *Jasonia glutinosa* etc. are directly or indirectly descended from purely African types, which must have inhabited the vast expanse of North Africa including the Sahara, when under different conditions of climate, that land was a well watered and fertile region. Of course, even to day, many Maltese species are found also in Sicily and Africa, but the species of more xerophilous character began to travel northwards to the Maltese Islands, when the climatic conditions, and consequently the temperature and the distribution of rain were gradually altering to their present state, in the Postpliocene and Early Quaternary.

## **CLASSIFICATION.**

### **Synopsis of Orders and Families.**

Plants producing no flowers and no seeds.

## Sub-Kingdom I - CRYPTOGRAMIA.

Plants producing flowers and seeds, having an  
Embryo with one, two, or more cotyledons.

## SUB-KINGDOM II - PHANEROGAMIA OR SPERMATOPHYTA

### I - CRYPTOGRAMIA

Plant consisting of a *thallus* of one or more cells. Sexual and asexual generations irregularly alternate. The *sporophyte* stage wanting or very reduced. No fibro-vascular bundles (*Not included in this work*)

Group A - Thallophyta.

Plant consisting of a pluricellular *thallus*, with rhizoids but no true roots; and with full development of an alternate generation, sexual and asexual. The sexual plant or *gametophyte* being always well developed with *antheridia* and *archegonia*, but the asexual plant or sporophyte stage being limited to a special structure called the *sporogonium*. No fibro-vascular bundles. (*Not included in this work*).

Group B - Bryophyta.

Plants with a well marked alternate generation. Thallus plant-like with fronds and stems, and with true roots, and constitutes the asexual or sporophyte stage. The gametophyte stage consists of a small *prothallus*, having rhizoids on the lower surface, as well as antheridia and archegonia. There are true fibro-vascular bundles in the sporophyte plant.

Group C - Pteridophyta.

### II - PHANEROGAMIA OR SPERMATOPHYTA.

#### CLASS a - GYMNOSPERMAE.

The Gymnosperms have always unisexual flowers, in monoecious or dioecious plants. The flowers, beyond their sporophyll have no involucre, except in the Gnetaceae, in which the flower has *phyllomes*, which act as an involucre. The carpellary leaf or macro-sporophyll is therefore *nude*. Cotyledons usually two, but often more.

Woody plants with a palm-like habit. Stem usually simple, terminating in a rosette of large pinnate leaves, which are leathery, persistent, and crozier-shaped in veneration, alternating with squamous cataphylls. The bundles are collateral, but the stem may be endowed with secondary growth in thickness. Flowers dioecious. The carpellary leaf shows the pinnate character of the foliage, but is devoid of chlorophyll, and is covered with yellowish or tawny hairs. The male flowers are borne on sporophylls united in a terminal and spiral strobila, often very large, which is afterwards pushed laterally by the growing stem.  
Order: Cycadinae.

Includes the only family Cycadaceae, not represented in our Flora, but several species are cultivated for ornament.

Plants tree-like, with cuneate bilobed leaves, on a long petiole. Flowers dioecious. The staminiferous sporophylls are on a long axis, without an involucre. The ovules are two, on a short shoot, with the macrosporophylls reduced to a collaret around the base of the ovules.  
Order: Ginkgoinae.

The only existing representative is *Ginkgo biloba* or *Salisburia adiantifolia* of Japan, frequently cultivated as an ornamental tree.

Trees or shrubs, usually with resinous canals, but without true vessels in the fibrous bundles, generally inhabiting the temperate regions, or the mountains in warmer climates. Flowers monoecious or dioecious, and naked. The male flowers are catkin-like, with scale-like microsporophylls or staminal leaves bearing the pollensacs on the under surface. The female flowers and the fruit are variable. Leaves always simple, acicular, scale-like, prismatic, or rarely flat.  
Order: Coniferae.

Woody plants, shrubs or climbers, without resin, but with true vessels. Leaves variable or wanting. Flowers monoecious, the female flower having an imperfect perigone, made of scaly phyllomes  
Order: Gnetinae.

## CLASS B - ANGIOSPERMAE.

The Angiosperms are flowering plants producing seed or seeds enclosed in one or more carpels, united together to form one ovary, or less commonly free. The flowers are generally hermaphrodite or unisexual by abortion and consist normally of four whorls forming the calyx and corolla, the third whorl whether single or multiple forming the stamens, and the carpel or carpels forming the fourth whorl. Cotyledons two or one.



## SUBCLASS I - DICOTLAEE (Dicotyledones).

The dicotyledons are plants with seed having two cotyledons, which may be hypogean or epigean, and are very rarely and abnormally missing. The fibro-vascular bundles of the stem are open, and arranged in a circle or tube, constituting the stele, with a layer of cambium between the inner bundles of xylem and the outer bundles of phloem. The stem is therefore capable normally of growth in thickness by the periodical growth of the cambium into layers of xylem on the inside, and into layers of phloem or bast on the outside. The leaves are variable, rarely sheathing, and usually with pinnate and anastomosing nerves.

### SERIES I - CHORIPETALAE.

Plants having flowers with a single or double perianth, and if double polyphyllous.

#### A - MONOCHLAMIDAE.

Perianth reduced to a single whorl.

Order I. QUERCIFLORAE - Large trees or shrubs, with monoecious flowers: the male flowers forming catkins, and the female flowers variously grouped. The ovary is inferior, and the fruit is a one-seeded nut without endosperm.

Cupuliferae

2. SALICIFLORAE - Dioecious trees and shrubs, deciduous, flowering before the foliage. Ovary bicarpellary, unilocular, forming a capsular fruit with many seeds, without endosperm but furnished with hairs.

Salicaceae.

3. URTICINAE - Large trees, shrubs, and herbs with small flowers collected together in dense heads. Stamens equal in number to the segments of the perianth. Ovary superior, unilocular, with only one ovule. Seeds usually albuminose.

Ulmaceae, Moraceae,  
Urticaceae.

4. LORANTHIFLORAE - Semi-parasitic or parasitic plants, usually monoecious, with a tetramerous green or whitish perigone. Santalaceae, Balanophoraceae.

5. POLYGONINAE - Perennial herbs or creepers, with hypogynous, hermaphrodite flowers, sometimes unisexual by abortion: usually timerous, without perianth or perianth developed as a perigone, often coloured. Ovary unilocular, with a single basal anatropous ovule. Fruit a nutlet.

Polygonaceae.

6. TRICOCCAE - Herbs, shrubs, or trees, usually with a milky or yellowish juice; with single leaves and monoecious flowers, usually inconspicuous, but sometimes furnished with showy or petaloid bracts. Perianth usually simple or

wanting, rarely double. Ovary trilocular, sometimes 2-1 locular by abortion, with one or two suspended ovules in each loculus, with the micropyle directed upwards and outwards, and covered by a caruncle or fleshy hilum. The fruit is a trilocular capsule, each cell containing one seed, sometimes bilocular or monolocular.

Euphorbiaceae, Callitrichaceae.

7. CENTROSPERMAE - Herbs or shrubs, with simple exstipulate leaves. Flowers hermaphrodite, hypogynous or epigynous, more or less pentamerous; sometimes naked, but usually with a perigone or with a calyx and corolla, or with a perianth of many segments. Ovary usually unilocular, with a single basal ovule, or with a central or parietal placenta and numerous campylotropous ovules. Seeds albuminose, with a curved embryo.

Chenopodiaceae, Amarantaceae, Phytolaccaceae,  
Frankeniaceae, Tamaricaceae, Elatinaceae,  
Caryophyllaceae, Aizoaceae, Cactaceae, Portulacaceae.

#### B - DIALYPETALAE.

Flowers with a calyx and corolla always formed of distinct segments.

8. POLYCARPICAЕ - Herbs, shrubs, climbers and trees, with simple exstipulate leaves, and usually with hermaphrodite, large flowers on a long axis, on which the floral whorls are disposed spirally, with an apocarpous gynoecium and numerous stamens. The carpels are very rarely syncarpous, and always terminate in a sessile stigma. Rarely the calyx and corolla are indistinct, and sometimes there is no corolla and then the calyx becomes petaloid. Ranunculaceae, Lauraceae, Aristolochiaceae.

9. RHOEADINAE - Herbs, annual, biennial or perennial, with alternate simple leaves without stipules. Flowers hypogynous, hermaphrodite and usually dimerous. The ovary is unilocular with parietal placentae, often, more or less introflexed to form false dissepiments.

Resedaceae, Papaveraceae, Fumariaceae, Cruciferae,  
Capparidaceae.

10. CISTIFLORAE - Herbs, shrubs and trees, with simple usually alternate leaves, and with pentamerous flowers and usually many stamens, which may be free or united in bundles. The ovary is epigynous and syncarpous, of 3-5 carpels, but ordinarily unilocular with parietal placentae. Seeds with a straight embryo.

Cistaceae, Violaceae, Cuttiferae (Hypericaceae).

11. COLUMNIFERAE - Trees, shrubs and herbs, with simple leaves, usually alternate and stipulate. Flowers actinomorphic, hermaphrodite and pentamerous: hypogynous. Stamens usually monodelphous, and although typically 5 in number, are usually divided into an indefinite number. The fruit is syncarpous and septate; typically of 5 carpels, which may become divided

resulting in a multilocular fruit.

Malvaceae.

12. GRUINALES - Trees, shrubs and herbs, with hermaphrodite actinomorphic flowers, exceptionally zygomorphic, pentamerous, with a superoid multilocular ovary. Stamens often united at the base, and in tow whorls each of 5 stamens, with isolated nectaries situated outside the stamens, or with a nectariferous disk inside the stamens.

Geraniaceae, Oxalidaceae, Linaceae, Zygophyllaceae, Rutaceae, Aurantiaceae, Simarubaceae, Meliaceae, Polygalaceae.

13. SAPINDINAE - Trees, shrubs and climbers, chiefly of tropical regions, with zygomorphic flowers, usually greenish and inconspicuous, clustered together in compound racemes or panicles. Fruit a drupe, or a capsule, dehiscent or indehiscent, or separating into loculi, and often winged. Anacardiaceae.

14. FRANGULINAE - Trees, shrubs and creepers, with small actinomorphic greenish and inconspicuous flowers, in the axils of the leaves, or in racemes simple or compound. Perianth of 4 pieces, stamens 4 placed on the petals, with an intrastaminal disk, ovary with 2-5 loculi, each with one or two ovules, with the micropyle directed downwards. Rhamnaceae, Vitaceae.

15. ROSIFLORAE - Trees, shrubs and perennial herbs, with alternate stipulate leaves. Flowers perigynous or epigynous, very generally actinomorphic, with pentamerous perianth. Stamens usually numerous. Fruit various.

Crassulaceae, Saxifragaceae, Rosaceae.

16. LEGUMINOSAE - Trees, creepers and herbs, with alternate leaves, generally compound and stipulate. Flowers usually showy, and commonly grouped together in heads, spikes, racemes or panicles, and very generally zygomorphic, hypogynous or slightly perigynous. Perianth usually pentamerous, and stamens very generally diplostemonous. Gynoecium monocarpellary, usually with numerous ovules attached in two rows to the ventral suture. Fruit a legume, and seeds generally exalbuminose.

Mimosaceae, Caesalpiniaceae, Papilionaceae.

17. MYRTIFLORAE - Trees, shrubs and herbs, with simple, generally opposed, without stipules. Ovary with 2 or more loculi; fruit syncarpous; seed without albumen. Lythraceae, Onagraceae, Myrtaceae, Punicaceae.

18. UMBELIFLORAE - Trees and shrubs, but mostly herbs, annual, biennial or perennial. The inflorescence is a typical umbel, simple or compound, or made of umbels grouped together in a panicle. Flowers actinomorphic, hermaphrodite, epigynous, pentamerous or tetramerous, with a very small calyx, one whorl of stamens, and an inferior ovary, generally with 2 carpels, sometimes with more than 2, with only one pendulous ovule in each carpel. There is a nectariferous disk on the ovary. Araliaceae, Umbelliferae.

## SERIES II - SYMPETALAE OR GAMOBETALAE

Flowers always with distinct calyx and corolla, this last being always gamopetalous.

#### A - PENTACYCLICAE.

Flowers with five whorls, viz: calyx and corolla of one whorl each; androecium of two whorls, and the gynoecium.

Order I. ERICINAE - Shrubs, rarely trees. Flowers actinomorphic and usually hypogynous, Corolla sometimes choripetalous, but usually sympetalous. Stamens in two whorls, not adnate to the corolla. Ovary multi-locular. Leaves acicular or lanceolate. Ericaceae.

2. PRIMULINAE - Herbs and shrubs. Flowers hypogynous, actinomorphic. Outer whorl of stamens wanting; the inner whorl adnate to the corolla. Ovary pluricarpellary but unilocular, with free central placenta. Primulaceae. Plumbaginaceae.

#### B - TETRACYCLICAE.

Flowers with four whorls; with only one whorl of stamens.

Ovary Superior.

3. CONTORTAE - Trees, shrubs often climbing, and herbs annual or perennial, with opposite decussate leaves, very generally entire and usually simple. Flowers actinomorphic, with the corolla usually *contorted* or twisted in the bud, and therefore with imbricate aestivation. Stamens inserted on the tube of the corolla.

Oleaceae, Gentianaceae, Apocynaceae,  
Asclepiadaceae.

4. TUBIFLORAE - Trees and shrubs, but mostly herbs annual or wining; with alternate simple leaves. Flowers actinomorphic, rarely slightly zygomorphic, hypogynous. Stamens inserted on the corolla, 5 in actinomorphic flowers, reduced to 4 or 2 in zygomorphic flowers. Ovary bilocular, sometimes trilocular, often with false dissepiments, with 2 ovules in each loculus.

Verbenaceae, Labiatae.

5. PERSONATAE - Usually herbs, annual or perennial, sometimes shrubs, with simple alternate or opposite leaves, entire or variously cut. Flowers usually large and showy, hypogynous and mostly zygomorphic and bilabiate. Stamens inserted in the corolla, normally five, but very often reduced to four or even two. Ovary bicarpellary with numerous ovules in each loculus. Fruit generally a capsule, but sometimes a berry, or even a siliquose pod when there is a false dissepiment.

Solanaceae, Scrophulariaceae, Orobanchaceae,  
Plantaginaceae, Acanthaceae, Myoporaceae.

### Ovary Inferior.

6. RUBINAE - Trees, shrubs or herbs, with opposite leaves mostly stipulate, and often whorled. Flowers actinomorphic or zygomorphic, tetramerous or pentamerous; with the androceum of 4 or 5 stamens inserted on the corolla, the number being increased or reduced in zygomorphic flowers. The calyx is always greatly reduced, and the ovary is 2-3 locular.

Rubiaceae,  
Caprifoliaceae, Valerianaceae,

Dipsaceae.

7. SYNANDRAE - Vary generally herbs, annual or perennial, rarely woody shrubs, with simple alternate and stipulate leaves. The flowers may be actinomorphic or zygomorphic, are often large and showy, sometimes produced singly in the axils of the leaves, but generally in dense spikes or heads, lateral or terminal. The anthers, and often the entire stamens, are connivent or fused together in some way or other.

Cucurbitaceae, Campanulaceae, Lobeliaceae, Compositae.

### SUB-CLASS II - MONOCOTYLAEE (Monocotyledones).

Are angiosperms furnished with only one cotyledon. Their flowers are constructed mostly on the trimerous and pentacyclic type, the two first whorls, calyx and corolla, are generally equal and similar, and constitute the perianth. The seed is usually furnished with abundant albumen. Their stems have closed vascular bundles, without a continuous cambium; and in rare cases when a cambium is present as a secondary formation, it is outside the original vascular bundles. The nerves of the leaves are generally more or less parallel, and not anastomizing.

#### A - FLOWERS ACTINOMORPHIC.

Order I. HELOBIAE - Are aquatic or pond plants, with regular flowers having an apocarpous gynoecium formed of two whorls, the carpels maturing into fruits which are achenes or follicles, and seeds contain a large embryo, but no perisperm around it.

Alismaceae, Juncaginaceae, Potamogetonaceae, Najadaceae.

2. LILIIFLORAE - Plants with actinomorphic, pentacyclic flowers, always with complete fully developed whorls. Ovary superior or inferior, trilocular. The flowers are rarely slightly zygomorphic. Endosperm always present around embryo.

Juncaceae, Liliaceae, Amaryllidaceae, Iridaceae, Dioscoreaceae.

#### B - FLOWERS MORE OR LESS REDUCED.

3. GLUMIFLORAE - Annual or perennial plants with grass like habit and linear parallel veined leaves. Inflorescence of many small flowers in spikes or panicles, protected by numerous glumes or glume-like bracts. Flowers hypogynous, sometimes unisexual, naked or with a very reduced perianth or perigone. Ovary

unilocular, with only one ovule. Seed a typical caryopsis.  
Cyperaceae, Gramineae.

4. SPADICFLORAE - Perennial herbs and trees, with actinomorphic, hypogynous flowers, frequently reduced, and usually diclinous (monoecious or dioecious). The inflorescence is typically a fleshy spike or *spadix* or a compound spike, always with one or more large sheathing bracts called *spathes*, at the base. Typhaceae,

Sparganiaceae, Palmae, Araceae, Lemnaceae.

#### C - FLOWERS SYCOMORPHIC.

Perennial herbs; with epigynous, hermaphrodite, zygomorphic flowers. The androecium is reduced to one fertile anterior stamen, with one staminode on each side, adherent together to the style and forming a column. The ovary is typically tricarpellary and unilocular, inferior, with parietal placenta. The fruit is a capsule, with very numerous and minute seeds, without albumen. The embryo is unsegmented, that is shows no development into a cotyledon and a plumule, before germination. Orchidaceae.

#### VASCULAR CRYPTOGRAMS.

(Pteridophyta).

ORDER FILICES.

POLYPODIACEAE.

*Note:* - for want of the usual conventional signs, the following have been adopted:-

(A)-Annual. (B)-Biennial. (P)-Herbaceous Perennial. (S)-Shrub or Tree.

Perennials, very rarely annuals. Fronds arising from the upper surface of creeping rhizomes or caudex, or forming a regular crown on erect stems; crozier-shaped in veneration, simple, sometimes entire, usually pinnatifid or pinnatisect. Sporangia gathered together into groups or *sori*, growing on a fleshy cushion or placenta inserted on the nerves at the back of the frond or along the margin. A pellicle or *indusium* usually covers the sorus. Sporangia dehiscing longitudinally or irregularly, containing numerous spores grouped in fours within cells (mother-cells), the membrane decaying and setting free the spores, which on damp soil develop a cellular or leaf-like expansion (*prothallus*) furnished with rhizoids. The prothallus develops on its under-surface, the male organs in the shape of the antheridia containing antherozoids like flattened ciliated threads coiled spirally; and the female organs in the shape of cellular sacs or archegonia, usually only one archegonium open at one end, through which opening the antherozoid penetrates to fertilize the oosphere, transforming it into an oospore, which subsequently develops into a fern.

The family includes 130 genera with about 5600 species distributed chiefly in warm and temperate regions.

The rhizome of *Polystichum Filix-mas* is a well known antihelminthis. *Pteris aquilina*, *Adiantum Capillus-Veneris* and other species are used as diuretics and expectorants. Many species are cultivated for ornament.

#### CETERACH ADAMS.

Sori linear inserted along the lateral veins of each lobe of the frond, mixed with abundant scarious scales. Indusium absent, frond with spreading margin. Includes one species.

CETERACH OFFICINARUM W. Rhizome perennial, bushy. Fronds dying off in summer, 5-15 cm. Long, lanceolate, with short petiole, pinnatopartite, with alternate oval-obtuse entire lobes, separated by rounded angles: blade glabrous above, densely scaly on the under surface and on the petiole, with rusty-coloured scales. (P) Central and South Europe, Western Asia, Himalaya, Canaries, Madeira. Spores produced in spring and summer. *Malta*, rare or very rare, in moist caves or on the surfaces of rocks in cool situations: at Wied il-Ghasel, Gebel Sornu near Ghain Mula, Wied Ghar Dalam, Wied Ghomor. *Gozo*, very rare, said to be found in Wied ix-Xlendi. - *Asplenium Ceterach* L. E. Scaly-Fern, Rusty-back, Stone-Fern.

#### GYMNOGRAMME DESV.

Sori oblong-linear, inserted on the secondary nerves of the lobes, finally extending to all the lower surface of same. Indusium wanting. Fronds with spreading margins. Includes about 128 species, mostly native of tropical regions, a few being found in temperate regions.

GYMNOGRAMME LEPTOPHYLLA (L) Desv. Plant annual or rarely biennial, slender, bushy, with fibrous roots. Fronds delicate, 5 to 15 cm. Long, glabrous, with reddish brown petioles, shining, of an oval-lanceolate shape, of two sorts: some small, often sterile, pinnatoseptate, with fan-shaped lobulate or cut lobes; other larger, bi-tripinnatoseptate, with obovate-cuneate lobes, each with 2 or 3 rounded lobules (A) or (B) South and Western Europe, Africa, Western Asia, India, Australia, New Zealand, North America. In Spring. In moist places and on mossy walls or rocks, *Malta*, frequent here and there; at San Antonio Gardens, Boschetto, Wied Incita, Wied il-Ghasel, Ta Baldu, Wied Babu etc. *Gozo Xlendi*, *Ta Cenc*, *Nadur*, *Ghainsielem* etc. - *Polypodium leptophyllum* L. - *Grammitis leptophylla* Sw. E. Small rue-leaved fern. M. *Tursin ir-rieh*.

#### ASPENIUM L.

Sori oblong or linear, inserted along the sides of the secondary nerves. Indusium present, membraneous, adherent to the frond by its outer margin; the inner margin being free and directed towards the midrib of the lobes. Includes about 416 species, broadly distributed all over the world.

**ASPLENIUM MARINUM L.** Rhizome oblique, bushy. Fronds 1 to 4 dm. Long, with stiff petiole and midrib, shining black, coriaceous, glabrous, of a lanceolate shape. Lobes or segments trapezoidal, euneate and petiolate at the base which has an obtuse appendix on the upper margin, ovate or oblong, obtuse, unequally crenate-toothed; the middle lobes being 2 -5 cm. Long, more or less narrowly decurrent along the midrib. Indusium entire. (P) Central, Western and Southern Europe, Canaries, Azores, Brazil, Nova Scotia. *Malta*, rare or very rare: in moist shaded valleys. At Wied il- Ghasel, Wied iz-Zurriek, Melleha. *Gozo*, also very rare: at Xlendi, Rdum il Gbir (near nadur), Imgiar ix-Xini, Kala Dueira - *Asplenium lucidum* Boccone. E. Sea Spleen-wort.

**ASPLENIUM TRICHOMANES L.** Rhizome u.s. Fronds 1 to 3 dm. Long, with a shining black petiole and midrib, glabrous, with a very narrow crenate wing along the midrib. Segments sessile or subsessile, obovate or roundish, cuneate or abrupt at the base, crenulate along the margin, sometimes hastate or winged at the base. Indusium entire. (P) Spring and summer; the foliage often dying off in summer. In temperate and cold regions, and in mountainous tropical regions. *Malta*, very rare, Wied Babu and Gebel Sornu near Chain Rihana. *Gozo*, very rare, Imgiar-ix-Xini. E. maidenhair Spleen-wort.

#### SCOLOPENDRIUM SMITH.

Sori linear, parallel to each other, obliquely set to the midrib, inserted between two secondary nerves. Indusium membranous, opening in two valves along the middle. Includes 11 species, natives of the temperate and cold regions of Europe, Asia and America.

**SCOLOPENDRIUM VULGARE SM.** Rhizome short, scaly. Fronds lanceolate-linguiform 10 to 35 cm. Long, cordate and with rounded lobes at the base, subcoriaceous, entire or slightly corroded at the margin, obtuse or acuminate. Petiole short and scaly. Secondary nerves many and closely sets, mostly branching near the base. Sori 3-25 mm. Long. (P) Temperate Europe, North Africa, Western Asia, North America, Japan Madeira, Azores. On moist and shaded rocks and in wells. *Malta*, very rare: at Wied Babu, Wied Ghomor and Wied il-Ghasel - *Asplenium Scolopendrium* L. *Scolopendrium officinale* D.C. *S. officinarum* S.W. E. Common Hart's Tongue. I. Lingua cervina.

**SCOLOPENDRIUM HEMIONITIS Sw.** Rhizome u.s. Petiole squamous, rarely naked, short or longer than the blade. Blade 4 to 16 cm. Long, ovate, or the older ones oblong lanceolate, deeply cordate at the base, with spreading wing-like lobes at the base, sometimes hastate, with 2 to 4 lobes. Secondary nerves wider apart, branching higher up from the base. Sori 3 to 12 mm. long. (P) Mediterranean region. On moist and shaded rocks, and in wells and caves. *Malta*, rare, at Melleha, in many wells at Casal Lia, Musta and Birchircara. *Gozo*, more frequent, at Rdum il Gbir near Nadur, Kala, Ghainsielem, Cala Dueira, Xlendi, - *Scolopendrium sagittatum* D.C., *S. breve* Bert. The form: *bicaudatum mihi*, with fronds bifurcated or trifurcated at the apex, is met with at Ghain Tuffieha (Rdum tal Mixkuka) Melleha and Rdum il Gbir. E. Mule's Fern. M. Felci tal bir.



## PTERIS L.

Sori linear, very long, continuous, inserted in a groove along the margin of the segments of the fronds, with or without a true indusium, but always more or less covered with the reflexed margin of the groove. Includes about 130 species, mostly natives of warm and temperate regions.

**PTERIS AQUILINA L.** Rhizome very long, creeping. Fronds large, 3-20dm. Long, bi-tripinnatoseptate, with thick naked petioles, coriaceous, of an ovate-triangular shape, more or less pubescent on the under surface; lobes oblong-lanceolate, pinnatoseptate, with oblong lobules, obtuse, entire, sessile, broad at the base, the lower lobes often pinnatolobulate. Sori covered with the denticulate-ciliated margin of the lobes, and with a true ciliated indusium inserted internally. (P.) Almost comopolitan. Is in leaf in spring and summer. Gozo, on the clayey soils at San Blas and Rdum il Gbir near Nadur. - *Pteridium aquilinum* Kuhn. E. Braken, Eagle-Fern. I. Felce aquilina or Felce capannaja. M. Felicita or Felicilla.

**PTERIS LONGIFOLIA L.** Rhizome creeping, scaly at the apex. Fronds 1 to 9 dm. Long, with short petioles scaly at the base, coriaceous, lanceolate in outline, with 6 or many pairs of long simple segments, which are opposed, linear-lanceolate, 1 to 20 cm. Long, decreasing in size towards the base, subsessile, unequally cordate at the base, the fertile fronds having the lower segments sterile. Sterile fronds with cartilaginous finely-toothed margin. True indusium wanting. (P.) Tropical and warm temperature regions. *Malta*, rare, naturalised in gardens at Casal Lia and Birchircara, along shaded walls. - *Pteris vulcanica* Bert.

**PTERIS CRETICA, L.** Fronds with 2 to 9 pairs of segments; the lower segments tripartite or bipartite. In the fertile fronds all segments are fertile. Sterile fronds with segments finely toothed. Fronds 2 to 6 dm. Long, with long petioles, naked from the base, ovate-oblong in outline. Segments 1 to 2 dm. Long, the lower at least as long as the upper. The rest u.s. (P.) In tropical, warm and temperate regions. *Malta*, naturalised in warm moist country-yards and gardens, especially at Hamrun and Birchircara - *Pteris oligophylla*. Viv. Several forms such as *vittata* Sm., *albo-lineata* Hort., *cristata* Hort., etc., reproduce themselves well by spores.

## ADIANTUM L.

Sori round or oblong, inserted at the apex of the lobules, on the upper surface of the indusium which has the shape of a crescent like scale, continuous with the margin of the lobule, opening downwards. Includes about 114 species, mostly natives of tropical regions, especially of tropical America, a few extending into temperate regions.

**ADIANTUM CAPILLUS-VENERIS L.** Rhizome creeping, scaly, irregular, bushy. Fronds 1 to 5 dm. Long, soft, with petiole and nerves, naked, slender, dark brown or black, shining, broadly oblong in outline, bi-tripinnatoseptate; lobes petiolate, cuneate-obovate, inequilateral, obtusely palmate-lobulate at the apex. Sterile lobules crenate-denticulate, rarely laciniate. (P.) In tropical and warm temperate

regions. *Malta*, *Gozo* and *Comino*, frequent and often common in caves, wells, and on moist rocks in shaded valleys. E. Maidenhair. I Capelvenere. M. Tursin il Bir.

## SALVINIACEAE.

Annual aquatic floating plants. Fronds with margins reflexed in veneration, usually reddish on the under surface, rounded or lobed, sessile or subsessile, alternate or distichous. Antheridia and sporangia enclosed in distinct conceptacles or sporocarps. Antheridia spherical, on a branched basilar column. Sportania ovoid, pedicelled, arising from a central column, each sporangium containing only one large spore which develops a prothallus, usually with several archegonia. The family included 2 genera, with 18 species, mostly natives of warm and tropical regions.

### SALINIA (Mich.) Schreb.

Sporocarps globose, grouped under the fronds or leaves, among the fibrous roots. Macrosporangia and microsporangia, in similar but distinct sporocarps. Includes 13 species, all limited to tropical regions of Asia, Africa and America, except the following.

*SALVINA NATANS* (L.) All. Fronds or leaves distichous, opposed, with very short petiole, oval-elliptical, with dark applied hairs on the lower surface, and with stellate hairs on the upper surface. Rootlets plumose; stem simple or slightly branched. (A.) Temperate warm regions of Europe and Asia. July-August. *Gozo*, in ponds at Wied il Lunziata according to Gulia; must be very rare. - *Marsilia natans* L. I. Erba-pesce.

## ORD. EUISETANAE.

### EUISETACEAE.

Perennial herbs with subterranean rhizome, inhabiting moist places. Stems straight, cylindrical, stiff, fistular, striated or grooved, simple or branched, jointed. Joints furnished with a membranous sheath denticulate at the top. Branches when present whorled, arising from the joints or base of sheaths, resembling the stems. Fructification in spikes or conical catkins, terminal, produced in summer from the top of the stems and branches, or arising directly from the rhizome in winter. Spike formed of several whorls of pedicels, with a peltate head or clypeolum, bearing on its inner surface 6 to 9 sporangia in a whorl around the pedicel. Sporangia dehiscing longitudinally on the side next to the pedicel. Spores numerous, spherical, with two pairs of filiform appendages (elateria) coiled spirally around the spore, flattened at their end, uncoiling and expanding

when moistened. Prothallus irregularly lobulate, commonly dioecious, with ovoid antheridia. Archegonia in the shape of globose, bright-red organs, with a globose ventricle and a long neck, with 4-lobed rim.

The Equisetaceae include only one genus.

The epidermis contains much silica, and the stems are therefore used for cleaning metals and polishing wood. An infusion of the stems of *Equisetum* is often used as a diuretic in cases of gravel.

### EQUISETUM (Tourm.) L.

Same characters as those of the family. Includes about 20 species, broadly distributed, especially in temperate and cold regions.

*EQUISETUM RAMOSISSIMUM* Desf. Stems 1 to 12 dm. High, simple, or more commonly branched, with 5 to 25 ridges, the ridges being convex, scabrous. Sheaths cylindrical broader at the top, with pronounced ridges, and subulate teeth, usually persistent. Stomata in 2 series in each groove. Spike ovate, dense, sessile. (P.) Cosmopolitan. Frequent in fields and moist places, in shaded valleys and also along field walls in exposed but moist situations. *Malta*, Boschetto, Ta Baldu, Imtahleb, Ghain il Gbira, Ghirghenti, Saline, Gneina, Ghain Tuffieha, Wardia, San Martin, etc. *Gozo*, Wied il Lunziata, Xlendi, Wied Bingemma, Imgiar-ix-Xini, Marsalforno, etc. - *Equisetum ramosum* Sehlisch in C.C. E. Branched Horsetail. I. Coda di Cavallo, Brusca. M. Demb iz-Ziemel.

The form: *elongatum* W. - *Equisetum ramosissimum* var. *altissimum* A. Br., with branched stems 5 to 12 dm. High, sheaths 16 to 20 mm. long, with 9 to 25 ridges, is more frequent in exposed and moist situations as at Saline and Melleha. The form: *pannonicum* Kit. in W. - *Equisetum ramosum* var. *virgatum* A. Br., with stems 1 to 8 dm. High, mostly simple, with 5 to 16 ridges, and sheaths 10 to 14 mm. long, is met with in drier situations, at Boschetto, etc.

## ORD. LYCOPODINAE.

### SELAGINELLACEAE.

Perennials, rarely annuals, with a prostrate, creeping or erect stem, dichotomously branched: leaves, small scale-like in 4 rows, spirally disposed, dorso-ventral, the dorsal leaves being smaller, each with a small scale-like ligule on its upper side. Roots borne not directly by the stem, but by special organs like peduncles (rhizophores), originating in pairs from the bifurcations of the stem. Fructification terminal, sporangium in the axil of the leaf. Macrosporangium large with 4 large spores, disposed cross-wise in pairs. Microsporangium smaller, roundish, slightly flattened, with many microspores. Includes 3 genera with about

345 species distributed all over the world, mostly in tropical and subtropical regions.

### SELAGINELLA P. B.

Sporocarps globose, solitary, axillary. Macrosporangia few, at the base of spikes, the microsporangia being above them and more numerous. Prothallus dioecious. Spores yellowish, in groups of 4, having on one side 3 lines convergent towards an apical point. Plants moss-like. Includes about 330 species, mostly natives of tropical countries.

SELAGINELLA DENTICULATA (L.) Spring. Plant glaucous green, becoming reddish, and afterwards brick-coloured. Stem creeping and rooting, 5-15 cm. Long. Lateral or ventral leaves cuspidate, distinctly serrated, much larger than the dorsal or anterior which are more acuminate. Spikes solitary or in pairs, sessile or on branches; bracts similar to anterior leaves. Macrospores yellow, minutely and densely tubercled; microspores reddish, less densely tubercled. (A.) or (P.) Mediterranean region. Madeira, Canaries. March-April. *Malta*, on mossy moist rocks in shaded valleys as at Wied ghomor, Wied Kirda, Melleha, Gnien Ingrau. Gozo, Nadur, San Blas, Xlendi. - *Lycopodium denticulatum* L.

PSILOTUM TRIQUETRUM L. Psilotaceae; a native of tropical countries, has been found repeatedly in glass houses of gardens at Casal Lia.

### ISOETACEAE.

Perennials, grass-like, aquatic or terrestrial, stemless, with a globose or depressed rhizome; often dividing at the base into 2 to 4 individuals. Roots dichotomous, brown, velvety in the terrestrial species. Fronds in fascicles, straight with almost amplexicaul and scale-like base or phyllopede, like the scales of a squamous bulb, and with linear or subulate green blade. The phyllopede contains, on its inner surface, a membranous sac or sporangium, over which there is a small smooth transparent scale, called ligule.

The family includes only one genus.

### ISOETES L.

The same characters as above. Includes about 45 species, broadly dispersed all over the world.

ISOETES HYSTRIX Dur. Rhizome trilobed, covered with hardened scales, black, shining, short, prolonged into 2 processes, rarely with a shorter process between them. Leaves 10 to 40, recurved, linear, 4 to 13 cm. Long. Indusium complete. Ligule oval-acuminate. Macrospores minutely granulous; microspores spinescent. (P.) Mediterranean region, Western France, England. *Malta*, rare, in rocky depressions, where water accumulates in winter. - *Cephalocheeraton Hystrix* Genu.

The form: subinermis Durieu, with the scales surrounding the rhizome few and hardly prolonged into two stiff processes as in the typical form, is that more commonly met with - *Cephaloceron gymnocarpum* Genu., *Isoetes sicula* Tod. E. Quill-wort.

## PHANEROGAMIA.

### ORD. CONIFERAE.

#### PINACEAE.

Perennial woody plants, sometimes bushy, but often gigantic trees, which constitute the bulk of the forests in temperate and mountainous regions. Generally evergreen, and very rarely deciduous. Leaves simple, scale-like or acicular. Male flowers solitary or grouped in false whorls, with the aspect of an amentaceous inflorescence. Stamens scale-like, with 2 or more pollen sacs on the lower and outer side. Pollen grains usually winged or furnished with elaters. Female flowers usually united in to short spike or on a fusiform axis, with the carpels open and the ovules naked. The open carpel becomes woody and scale-like, the entire inflorescence forming a scone or strobila with scales orders spirally, or a galbulus with peltate opposed scales, disposed crosswise. Sometimes the female inflorescence is made of a few carpels and becomes berry-like at maturity.

The family includes 32 genera with about 350 species, natives chiefly of temperate and cold countries or of mountainous regions, a few inhabiting the tropics.

Many species of Pinaceae furnish valuable timber for construction work as well as for fuel. The white deal is furnished by *Abies alba* and *Abies excelsa*; the red deal is produced by *Pinus Laricio* etc., the red pine is furnished by *Pinus silvestris*, the pitch-pine is the produce of *Pinus australis* and *Pinus ponderosa*, the larch is produced by *Laryx decidua* and *Larix leptolepis*. *Pinus halepensis* furnishes excellent fuel and turpentine. The Cypress, *Cupressus sempervirens*, furnishes a fine timber, much used for furniture and especially for wardrobes, as it is supposed to preserve woollen cloths from moths. Resin, Burgundy pitch, spirit of turpentine etc., are obtained from various species of *Pinus* and *Abies*. Balsam of Canada is produced by *Abies balsamea*, *Abies Fraserii* etc. Venetian turpentine is the produce of *Larix decidua*. Gin is distilled from fermented berries of *Juniperus communis*, macerated in alcohol. Many species, such as *Cedrus Libani*, *Cedrus atlantica*, *Cedrus Deodara*, *Araucaria excelsa*, *Araucaria Cookii*, etc. are high ornamental.

#### PINUS (Tourn.) L.

Trees very resinous, with stiff acicular leaves in clusters of 2 to 6. Flowers monoecious; male inflorescence in small heads or catkins at the base of the new twigs and made of axis on which are spirally inserted many scale-like of

stamens, each having on the lower side 2 pollen sacs. Pollen grain with two lateral vesicles, one on each side, and hence reniform in shape. Female inflorescence, lateral, on new twigs, shaped like a cone made of fleshy carpellary scales, inserted spirally, having on the upper surface a placenta with 2 orthotropous naked ovules. The fruit is a typical cone or strobila, maturing in 2 years, woody, with persistent scales swollen into a shield at the apex, and bearing on the axil 2 winged seeds with a woody or stony shell. Embryo with 3 to 15 cotyledons. Includes about 70 species, natives mostly or subtropical and temperate regions in the northern hemisphere, a few being found in the tropics, in eastern Asia, western India and central America.

**PINUS HALEPENSIS**, Mill. Tree with an open pyramidal crown, up to 15 m. high. Leaves slender, soft, 7 to 9 cm. Long, in clusters of 2, with semicircular section, with 2 fibrous bundles. Cones reddish, smooth, peduncled, recurved, oblong-conical, 8 to 10 cm. long, 3 to 4 cm. in diam solitary or in pairs. Scales more or less thickened at the apex, where they are shaped like a shield, with a short or depressed process, and without keel. (S.) Mediterranean region. March-May. *Malta* and *Gozo*, cultivated for ornament; naturalised in the Verdala Park, Boschetto, Addolorata Cemetery etc. Formerly probably a true native. The ancient trees of this species existing in San Antonio Gardens, in the Maglio and elsewhere are said to have been grown from seed produced by trees which formerly existed truly wild at GhainZhuber near Melleha, and at Wied Zhuber near Zurriek. - *Pinus maritima* Desf. Non Lam., *P. hierosolymitana*, Jacq. E. Aleppo or Jerusalem pine. I. Pino d'Aleppo, P. di Gerusalemme. M. Zhuber, Prinjoli.

**PINUS PINEA** L. Stone pine, is cultivated for ornament and for the sake of the pine-stones. - M. Prinjoli tal-ichel. *Pinus canariensis* Chr Smith and *Pinus brutia* Ten. Are sometimes grown for ornament.

#### CALLITRIS VENT.

Flowers monoecious, rarely dioecious. Male flowers at the apex of the twigs, subsessile, solitary or in pairs, rarely multiple. Stamens on short slender filaments, anthers twisted spirally, with 2-4 cells, dehiscing dorsally. Female inflorescence a galbulus, on short pedicels, solitary or in clusters; with 4 to 6 scales, rarely 8, more or less in 2 series, thickened at the apex. Ovules many, at the base of each scale, erect. Galbulus globular, ovoid or pyramidal, dehiscing almost in a valvate manner, in 4, 6, rarely 8 valves, equal, or the 3 alternate ones smaller. Seeds many, oblong, crustaceous, with 2, or rarely 3 wings, with scanty albumen. Cotyledons 2, rarely 3. Imperfect seeds often wingless: the innermost seeds often abortive. Trees or shrubs with jointed, slender twigs, round or angular: leaves sometimes slightly acicular in young plants or on sterile twigs, usually like minute fleshy keeled scales, with decurrent keel.

Includes 14 species, natives of North Africa, Madagascar, Aurtalia and New Caledonia.

**CALLITRIS ARTICULATA** Asch et Gr. A shrub or tree 4 to 6 m. high, with spreading cylindrical branches, and compressed jointed, fragile twigs. Leaves opposed, adnate to the twigs except at the tip, in 4 series, scale-like, with a

resiniferous gland below the apex. Galbulus tetragonous, dark red, 12 to 14 mm. in diam., with 4 woody scales keeled at the back and shortly mucronate below the apex. 2 scales being smaller than the others and these are deeply grooved at the back near the base. Seeds with 2 broad membraneous wings. (S.) Southern Spain and North Africa. November-December. *Malta*, very rare at Makluba near Krendi, on the rocks at Wied Filep a branch of Wied il ghasel, and on rocks near Ghain Rihana. E. Sandarac gun tree. M. Gharghar. *Thuya articulata* Vahl. *Callitris quadrivalvis* Vent. This shrub or tree was formerly much more common in Malta than it is at present. The various places called Ghar-ghar, Ghar-ghur etc. point out to the existence of extensive growth, and possibly small forests. It is now on the verge of extinction. The trees existing in the Public Gardens etc. have been raised originally from plants brought from Makluba. The drops of pale yellow or white resin exuded by the trunk is the Sandarac gum of the ancients. The wood is the celebrated *citron-wood* of the Romans, of which it is claimed that Pliny possessed one thousand tables.

### CURPRESSUS L.

Flowers monoecious, terminal. Male flowers solitary, catkin like, oval, with stamens in 4 series connate in a column, each with 4 pollen sacs inserted like a scale below the connective. Female flowers on short pedicels, also catkin-like, made of bracts, opposed and crosswise, of which the innermost are sterile. Bracts numbering 6 to 14, woody, peltate, mucronate at the back, forming a globose or ovate galbulus. Seeds many, winged. Includes 12 species, natives of Southern Europe, temperate Asia, North Africa and Mexico.

CUPRESSUS SEMPEVIRENS L. A large tree, up to 25 metres high, with cylindrical twigs. Leaves scale-like in 4 rows, with an oval resiniferous gland at the back. Crown more or less oval, with spreading or horizontal branches, but at first more or less pyramidal in aspect. Galbulus globose or oval, at first green, maturing in about 2 year. Seeds many in each scale, angular-winged. (S.) Eastern Mediterranean region. March-April *Malta* and *Gozo*, cultivated for ornament, and often naturalised at Verdala Park, Boschetto, Addolorata Cemetary, Valletta fortifications etc. - *Cupressus sempervirens* var. *horizontalis* Mill. E. Cypress. I. Cipresso, Cipresso femmina. M. Cipress, Cipressa mara.

VAR. PYRAMIDALIS Targ-Rozz. Tree narrowly pyramidal, with dense erect compact branches, but usually with a distinct principal stem. Cultivated and naturalised with the preceding. E. Cypress. I. Cipresso maschio. M. Cipress, Cipressu ragel.

VAR. FASTIGIATA D.C. Tree narrowly and closely oval-pyramidal, much elongated and dense, with many erect fastigiate stems, erect and adpressed, but usually without a principal stem. Cultivated and naturalised with the preceding. Common names u.s.

The form: *truncata*, is a low tree, up to 4 metres high, with a dense oval crown, abruptly truncated, with many fastigiate branches, all more or less of the same height. Cultivated at Addolorata Cemetary and elsewhere but rare.

## ORD. GNETINEAE

### GNETACEAE.

Shrubby plants, not resinous, often sarmentose, with knotty jointed rush-like branches, opposed or in clusters, with very small setaceous leaves, without stipules, or aphyllous and sheathed at the joints, or with oval entire leaves, or with only 2 large permanent radical leaves. Flowers monoecious or dioecious, with sheaths or lacinate scales, the female flowers having a membranous tubular bifid calyx-like sheath or styliform open tube. Stamens solitary or 6 or many, connate in a column: anthers with 2 to 4 cells, with apical dehiscence. Ovule solitary, sessile, erect, sometimes surrounded by the stamens and abortive. The family includes 3 genera with about 40 species, mostly natives of tropical countries, a few being found in temperate regions.

### EPHEDRA (Tourn.) L.

Flowers dioecious, rarely monoecious. The male in catkins in the axils of imbricate bracts, in 4 series and connate at the base, having a herbaceous bifid perianth. The female flowers in catkins of 1 or 2 flowers, surrounded by an involucre of bifid or trifid scales, and consisting of an ovule enclosed by 2 sheaths, the outer perianth-like being fleshy, open at the top, and the inner being membranous prolonged into an open tube, exerted from the outer sheath and obliquely abrupt at the top. Fruit drupe-like, made of the outer fleshy scales, with one or two seeds having a cartilaginous involucre. Embryo with 2 cotyledons. Includes about 30 species, natives of subtropical and temperate regions.

EPHEDRA FRAGILIS Desf. A dioecious or rarely polygamous shrub, 10 to 15 dm. High. Stems rush like, jointed, striated and scabrous. Leaves rudimentary with sheaths shorter than they are broad. Male catkins 2 to 5 at each node, erect, each with 8-16 flowers, sessile or pedicelled. Anthers 4 to 6 for each flower, on a column twice as long as the perianth. Fruit with 2 seeds. (S) Mediterranean region and the Atlantic Islands. March-April. *Malta*, very rare, at Wardia in rocky places, according to Delicata. E. Shrubby Horse-tail.

## ORD. QUERCIFLORAE.

### CUPULIFERAE.

Trees or shrubs with alternate simple stipulate leaves. Flowers diclinous in axillary spikes; the male flowers have a single calyciform perianth with 5 or more stamens. The female flowers are singly or several together surrounded by a cupuliform involucre, which is accrescent. Ovary is trilocular with two anatropous ovules in each cell. The fruit is an involucre nut or acorn, usually one-seeded. Seed exalbuminous.



The family includes 8 genera with about 360 species mostly natives of temperate and cold regions of the northern hemisphere, extending into tropical Asia.

The Cupuliferae are mainly large forest and timber trees. The bark of *Quercus Suber* is the cork of commerce. The acorns of several species of Oak are used as food for animals; the cups and bark of other species furnish valuable tanning materials. The chestnut is a well known farinaceous food when cooked or baked. The oak-galls of commerce are produced by the puncture of a hymenopterous insect and the development of its larva.

### QUERCUS (Tourn.) L.

Flowers monoecious; the male in loose slender pendulous catkins, with a perianth 3-7 lobed, and with 6-8, rarely more stamens; the female flowers solitary with an involucre of imbricate scales, accrescent with the fruit and forming the cup. Ovary adherent to the perianth, 3-celled with 2 ovules, in each cell, and 3-4 styles. Achene large (acorn) with coriaceous pericarp, partly surrounded by the cup. Includes about 300 species natives of the temperate regions of the northern hemisphere and also of tropical Asia and America.

**QUERCUS ILEX L.** A tree 15-25 m. high, with a dull green crown of foliage, Leaves shortly petiolate, coriaceous, ovate or oblong, acute, entire or toothed, often with spinescent teeth, glabrous on the upper surface, tomentose white on the under surface. Fruits sessile on short-stalked racemes, cups with very adpressed tomentose scales. Acorns oval, maturing the same year in autumn or winter. (S.) Mediterranean region. April- May. *Malta*, Ballut tal Wardia where there are many very ancient trees of huge dimensions, Imgiebah close to Selmun where there are also 8 large trees, Boschetto, Wied Hazrun near Ta Baldu. These represent the remains of ancient forests of this evergreen oak. The huge trees at Ballut tal Wardia of which several have a trunk about 4 metres in circumference at the base, growing in a very rocky and dry locality, must be more than 800 years old, and should be considered as a national monument. The Maltese name Ballut recurs in many localities, and is due presumably to the former existence of this tree in such places. E. Evergreen Oak. I. Leccio, Elcio, Elice. M. Ballut (the tree), Lici (the wood).

The form: *gramunitia* L. with roundish leaves very acutely toothed, especially on young trees, and the form: *agrifolia* D.C., with leaves of deeper green and more toothed and spinescent, are frequent in all the places above mentioned.

The form: *triloba* mihi, having narrow acute leaves, with a small acute lobe midway on each side of the margin, formerly grew in the Boschetto Gardens.

**QUERCUS ROBUR L.** and its var. *pedunculata* Ehrh, are often cultivated, and are sometimes met with self-sown. The hazel-nut (*Corylus Avellana* L.) is also sometimes cultivated, but rarely fruits.

## ORD. SALICIFLORAE

### SALICACEAE.

Trees or shrubs with simple stipulate alternate leaves. Flowers dioecious and achlamydous, in sessile or pedicelled catkins, each flower being furnished with a membranous entire or lobed bract. Male flowers furnished with a glandular annular or urceolate disk instead of perianth; stamens 2 or indefinite, with filiform filaments, free or more or less connate, inserted centrally. Female flowers without perianth but with glandular annular or urceolate disk. Ovary sessile or pedicelled dimerous, one-celled, with 2 very short styles, connate, each sometimes with 3-5 lobed stigma. Ovules many, anatropous. Fruit a capsule, with 2 valves, and with numerous exalbuminous seeds, furnished with a tuft of hairs. The family includes the two following genera.

The species of *Salix* contain the alkaloid salicine in their bark and leaves, and the bark is used medicinally as astringent, febrifuge and antirheumatic. The bark of species of *Populus* contains in addition the alkaloid populine. Certain species of *Salix* are extensively cultivated for their twigs which are used in wicker work, and the bark is used for tanning.

### SALIX (Tourn) L.

Flowers dioecious in catkins, each in the axil of an entire bract, with 1 or 2 glands instead of perianth. Male flowers with 2, rarely 3-12 stamens, free or connate. Female flowers with one-celled ovary, sessile or pedicelled. Stigmas 2, sometimes bifid. Capsule bivalved, with many seeds enveloped in cottony hairs. Includes about 160 species, natives mostly of temperate and cold regions of the northern hemisphere.

**SALIX ALBA L.** A shrub or tree with reddish green flexible twigs. Leaves lanceolate-acuminate, whitish and tomentose on the under surface, greyish green on the upper surface, slightly toothed and glandular along the margin, stipules deciduous linear-setaceous. Catkins slender, with bracts hairy at the base. Style much reduced. (S.) Europe, Siberia, Western Asia, North Africa; cultivated elsewhere. March-April. *Malta*, rare, at Gnien il Gbir, Ghirghenti, Ghain il Gbira, Imtahelb, Boschetto, usually along streamlets. E. Common Willow. I. Salcio. M. Zafzafa.

The form: *vitellina* L. with golden yellow stems, is found along with the type at Gnien il Gbir.

**SALIX AURITA L.** A shrub or small tree. Leaves elliptical, about 3 times as long as they are broad. Catkins sessile. Bracts of catkins black at the tip. Style very short or the stigma is sessile. Leaves more or less hairy and grey on the lower surface, with prominent nerves. Stipules reniform. (S.) Europe, North Africa, Western Asia as far as Siberia.

VAR. PEDICELLATA Desf. Leaves entire or toothed pubescent on the upper surface especially when young, greyish green when adult. Capsule glabrous or pubescent, on a pedicel 6-8 times as long as the gland. *Malta*, rare, along streamlets at Imtahleb, Gneina, Bahria, Ghain il Gbira, Wied Gherzuma, Marsa. E. Round-eared Willow. I. Salica. M. Zafzafa.

## POPULUS L.

Flowers dioecious, in catkins with laciniate bracts. Perianth replaced by an urceolate disk. Male catkins denser; flowers with 4-30 stamens with purplish anthers. Female flowers as in *Salix*, but with stigmas always bifid. Includes 18 species, natives of North America, Europe, Western and Northern Asia, and North Africa.

POPULUS ALBA L. A tree with a whitish and greyish bark, which becomes fissured only when old, with pubescent buds and new twigs. Leaves tomentose white on the under surface, 3-5 lobed on the terminal branches, sinuate and angular on the lateral branches, green, glabrous or slightly cottony on the upper surface. (S) Central and Southern Europe, Asia Minor, Siberia and North Africa. February-March. *Malta*, Boschetto, Ghirghenti, Wied ir-Rum, Bahria, Bingemma, Ghain il Gbira. Etc. Gozo, Migiarrro, Xlendi, Wied il Kasab, E. White Poplar, I. Gattice, Alberello, Alberaccio, M.Luk.

The var. *nivea* Hort., with smaller leaves of a lighter green, and silvery white on the under surface, is naturalised in the Boschetto and elsewhere.

*Salix babylonica* L., *S. Simoni* etc., *Populus nigra* L and *P. tremula* L. are sometimes cultivated.

## ORD. URTICINEAE

### ULMACEAE.

Trees or shrubs with alternate, distichous, simple, stipulate, asymmetrical leaves. Flowers hermaphrodite with a herbaceous or slightly coloured perianth 4-5-8 fid, erect and persistent after flowering. Stamens as many as the lobes of the perianth and opposite to them, inserted at the bottom of the perianth, with three filiform filaments. Ovary dimerous 2 celled or 1 celled, with 2 divergent styles, stigmatiferous along the inner surface; ovules solitary in each cell, anatropous. Fruit a membranous samara (*Ulmus*) or a one-seeded nut. Embryo exalbuminous. Includes 4 genera with about 70 species, distributed in temperate and tropical regions.

The species of *Ulmus* and *Celtis* are principally timber trees. The bark of species of *Ulmus* has mucilaginous properties.

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### ULMUS (Tourn) L.

Flowers hermaphrodite in lateral clusters appearing before the leaves. Perianth campanulate, persistent, 4-8 lobed or toothed. Stamens 4-9 Ovary compressed longitudinally, two-celled, with one ovule in each cell with two long stigmas. Fruit a compressed samara, expanded wing-like, with only one seed. Includes about 16 species, natives of temperate regions of the northern hemisphere.

**ULMUS CAMPESTRIS L.** A large tree, with distichous upper branches. Leaves ovate acuminate, unequal at the base, doubly serrated, scabrous, pubescent on the under surface. Flowers and samaras almost sessile, perianth 4-7 lobed Samara obovate, 1-2 cm. long, deeply emarginate almost down to the seed. Stamens 4-5. (S.) Europe, North Africa, Western and Northern Asia. February-March. *Malta*, at Ghain il Gbira, naturalised also at Boschetto and Addolorata Cemetary, along streamlets and in valleys, as well as on rocky ground. E. Common Elm L. Olmo. M. Ulmu.

The form: *suberosa* Moench., having the young stems winged with corky formations, is naturalised at Boschetto and San Antonio. *Ulmus americana* L., is sometimes cultivated.

## MORACEAE.

Trees and shrubs, rarely herbs, generally with milky juice, and with simple alternate leaves and fugacious stipules. Flowers diclinous, usually in the same inflorescence, sometimes dioecious. Perianth usually tetramerous, single, imbricate or wanting Ovary one-celled, with a solitary ovule. Fruit an achene or drupe or utricle, generally forming a compound fruit, a sorosium (*Morus*) or a syconium (*Ficus*). Albumen scanty, fleshy or wanting. Embryo curved.

The family includes 3 genera and about 610 species distributed in tropical and subtropical regions.

The Mulberry (*Morus alba* L.) is cultivated chiefly for the sake of its leaves on which the silkworm is reared. The bark of the Paper Mulberry (*Broussonetia*

papyrifera L'Her) is used in China for the manufacture of paper. The fruits of the Black Mulberry (*Morus nigra* L.) are valued for their refreshing and depurative quality. *Ficus carica* is the well known edible fig. Other species of *Ficus* furnish rubber. The milky juice of the Mulberry and especially of the common fig, as well as the scabrous margin of the leaves, are very irritating to the skin and may cause painful eruptions.

#### BROUSSONETIA L'HERIT EX VENT.

Flowers dioecious; the male in cylindrical catkins furnished with bracts, with a 4-toothed perianth and 4 stamens; the female in globose heads with villous bracts, with a 2-4 toothed perianth, ovary pedicelled, style simple. Fruit, a globose sorosium, with persistent perianth and bracts and pedicelled red drupes. Includes 2 or 3 species natives of eastern Asia.

**BROUSSONETIA PAPYRIFERA (L.) Vent.** A tree 10-20 m. high, with pubescent tomentose shoots and leaves. Leaves large, mostly alternate, ovate-acuminate, entire or deeply trilobed, serrated, 3-nerved at the base, tomentose white on the under surface. (S) Originally native of China. April-May. *Malta*, cultivated, and often freely reproducing itself by suckers and becoming naturalised; San Antonio, Addolorata Cemetery - *Morus papyrifera* L. E. Paper Malberry. I. Gelso da carta.

*Morus alba* L., the common mulberry, is often cultivated for the sake of its fruits and for ornament, or for the rearing of the silk worm, and is sometimes found self-sown. *Morus nigra* L, the Black Mulberry, has been long cultivated for its fruits.

#### FICUS (Tourn.) L.

Flowers monoecious, enclosed in a fleshy receptacle more or less pear-shaped, called syconium or hypoanthodium, with a small apical aperture furnished with scales. Male flowers on a short pedicel, with 3-5 cleft perianth, and with 1-6 stamens. Female flowers pedicelled, rarely sessile, with 3-5 cleft perianth. Ovary one-celled, rarely two-celled, with a lateral style and 1-2 stigmas. Fruit, a small utricle with a crustaceous pericarp, inserted on the fleshy or succulent receptacle. Includes about 600 species, natives mostly of tropical and subtropical regions.

**FICUS CARICA L.** A deciduous shrub or tree, with smooth ashy bark. Leaves alternate, scabrous on the upper surface, pubescent on the lower surface, broadly ovate and usually cordate at the base, with 3-5 toothed lobes, rarely entire. Receptacles large, more or less pyriform and pedicelled, which may be produced two or three times during the year, viz: before or along with the foliage on the old wood, these being of large size (E. Early figs. I. Fioroni, orni or grossi. M. Bajtar); a second crop is produced on the young wood (E. True figs. I. Forniti, fichi. M. Tin), and a third crop is produced later on, maturing in autumn. (E Late figs. I. Cratiri M. Tin imuahhar); the first and third crop may be wanting in certain varieties. (S.) Mediterranean region as far as North India; cultivated elsewhere.

*Malta, Gozo, Comino, Cominotto*, grows wild in valleys, rock-fissures, rocky places etc., and cultivated in many varieties or forms.

Var. *Caprificus* Risso - *Caprificus insectifera* Gasp. Leaves rougher, and usually more deeply divided. Receptacles or figs not eatable, though often fleshy. The early crop, called caprifigs contains usually many galls of *Blastophaga grossorum*, and from immemorial times is used for the caprification of certain forms of the common fig. E. Caprifig. I. Caprifico, Fico selvatico, Profico. M. Duccara.

## URTICACEAE.

Herbs, shrubs or trees, often armed with hairs either simple or glanduliferous containing an acrid and irritating juice. Leaves alternate or opposite, simple, petioled, entire toothed or serrated, rarely lobed, commonly furnished with stipules. Flowers monoecious, dioecious or polygamous in various inflorescences. Male flowers with simple perianth 2-5 cleft, with an equal number of stamens on filiform or subulate filaments, inflexed in aestivation and uncoiling elastically during anthesis, with a rudimentary ovary. Female flowers with 2-5 cleft, mostly tubular perianth, rarely without perianth; stamens rudimentary; ovary free or adnate to the perianth, oval, sessile or shortly stipitate, one-celled, style terminal or sub-lateral, sometimes obsolescent; stigma simple capitate or penicillate. Ovule solitary, orthotropous. Fruit an achene or a drupe, naked or enclosed in the accrescent perianth, with fleshy and oily albumen, rarely exalbuminous.

The family includes 96 genera, with about 822 species distributed in tropical regions.

The well-known Ramie fibre is produced by maceration from the bark of *Boehmeria nivea*, and the fibre of *Urtica dioica* is occasionally used in the same way as hemp-fibre. *Parietaria officinalis* L., is used for poultices in cases of bronchial catarrh, and also as a diuretic on account of the abundance of nitrate of potash contained in its tissues. Certain tropical nettles are so powerfully irritating, that their stings are sometimes dangerous to life.

## URTICA (Tourn.) L.

Flowers monoecious or dioecious, in axillary spikes or heads. Male flowers with 4-cleft perianth and 4 stamens. Female flowers with 4-cleft perianth, with unequal lobes; ovary with only one ovule, and a sessile penicillate stigma. Achene compressed, enclosed in the persistent and accrescent perianth. Herbs with opposed toothed leaves, and furnished with stinging hairs. Includes about 30 species, distributed in temperate and subtropical regions.

*URTICA PILULIFERA* L. Plant annual, rarely biennial, dark green, with erect obtusely quadrangular stems, 3-6 dm. High. Leaves ovate or ovate-acuminate, truncated or ovate at the base, with large obtuse teeth, and with long stinging

hairs, having 4 free stipules at each node. Flowers in unisexual inflorescences; the female in long-stalked globular heads; the male in branched spikes in the axil of the lower leaves or mixed with the female inflorescences. (A.) or (B.) Mediterranean region as far as the Caucasus, East Indies, Central Europe and St. Helena. April-May. Common in *Malta*; less frequent in *Gozo* and *Comino*, along roads, on heaps of rubbish, in neglected corners close to buildings etc, rarely in fields and gardens.

The form: *balearica* L., with reddish stems and leaves cordate at the base, is often met with in Malta and Gozo, in the same localities. E. Roman Nettle. I. *Ortica*. M. *Hurrieka taz-zibeg*.

**URTICA MEMBRANACEA** Poir. Plant annual, mostly monoecious. Stem and leaves u.s. but of a lighter green, and with shorter stinging hairs, with 2 stipules at each node. Inflorescence in axillary stalked spikes, unisexual or bisexual; male spikes when present longer than the petiole of the leaf, with a broad rachis, the flowers being inserted on the upper surface; female or bisexual spikes shorter than the petiole (A) Mediterranean region, Canaries, Madeira, Azores. December-May. *Malta*, *Gozo* and *Comino*, very common, especially in gardens, orange-groves and fields. - *Urtica lusitanica* Brot.

The form: *neglecta* Guss., bearing only or mostly bisexual spikes, is frequent with the typical form especially in fields. E. Membraneous Nettle. I. *Ortica*. M. *Hurrieka*.

**URTICA URENS** L. Plant annual, with stems u.s. but shorter, up to 4 dm. High. Leaves ovate, deeply and acutely toothed, with stinging hairs, and with 4 free stipules at each node. Inflorescence in axillary subsessile spikes, usually shorter than the petiole of the leaf, all bisexual, and none with a flattened rachis. (A.) Temperate regions of the old world; naturalised in North America. December-April. *Malta*, *Gozo* and *Comino*, chiefly in fields among growing crops. E. Small nettle. I. *Ortica*. M. *Hurrieka*.

#### PARIETARIA (Tourn.) L.

Herbs with entire, alternate, petiolate leaves, without stinging hairs and without stipules. Flowers polygamous or monoecious, axillary, in clusters or solitary. Polygamous and male flowers with a 4-cleft perianth, and with 4 stamens uncoiling with elasticity during antheses: ovary elliptical with penicillate sessile stigma, rudimentary in male flowers. Female flowers with tubular 4-toothed perianth with exserted style. Achene compressed, enclosed in the persistent perianth. Includes about 8 species, natives of temperate regions.

**PARIETARIA OFFICINALIS** L. Plant perennial, often woody at the base, pubescent, rough, with many stems, with oval-lanceolate leaves, with ternate nerves. Flowers in sessile, geminate clusters, with oblong or oval bracts more or less connate at the base forming a green involucre to the fruit: the female flowers in the bifurcations of the cyme, and one-bracteate; the hermaphrodite at the apex of the cyme and 3-bracteate. (P) Mediterranean region, Central Europe and Asia as far as Tibet, the Canaries. Flowers all the year. *Malta*, *Gozo* and *Comino*,

very common everywhere, especially along walls of fields and gardens and in shaded localities. The typical form (var. *erecta* M. et K) has erect stems, little branched, and oblong-lanceolate acuminate leaves, restricted at the base. E. Wall Pellitory. I. Muraiola, Erba vetriola. M. Xeht ir-rieh.

Var. *judaica* L. Stems prostrate or diffuse, much branched. Leaves smaller, oval, acute, cuneate or abrupt at the base. Flower clusters smaller, with longer bracts. Perianth of hermaphrodite flowers more accrescent after fertilization. - *Parietaria diffusa* M. et K. With the type and often replacing it in more open situations.

Var. *populifolia* Nym. Leaves oval-triangular, truncated or cordate at the base. *Malta*, *Gozo* and *Comino*, along roads and in dry situations. Is rather a form than a distinct variety.

**PARIETARIA LUSITANICA** L. Plant annual, with filiform, prostrate stems, ½ dm. Long. Leaves oval, very small, trinerved at the base, pubescent and rough. Flowers in axillary solitary clusters of 3-7 flowers, with an involucre of bracts u.s. Hermaphrodite flowers few and sterile; female flowers with perianth hardly accrescent but becoming hardened. (A) Mediterranean region, Austria as far as the Caucasus. April-May. *Malta* at Wied ilGhasel. *Gozo*, in shaded and rocky localities at Xlendi and Imgiar ix-Xini.

## ORD. LORANTHIFLOAE.

### SANTALACEAE.

Herbs, shrubs or trees, semiparasitic on the roots of other plants. Leaves alternate or opposite, entire, usually narrow, often short and scale-like, rarely petioled, without stipules. Flowers usually hermaphrodite and inconspicuous, with a single perianth, and stamens as many as the lobes of the perianth, and opposite to them. Ovary inferior, or adherent by the base only, one-celled, with 2-5 ovules. Fruit dry or fleshy, one-seeded, with a straight embryo and fleshy albumen.

The family includes 28 genera, and about 220 species, natives of tropical and temperate regions.

*Santalum album* and other species, natives of Southern Asia yield an aromatic and scented wood, used in medicine and in perfumery.

### THESIUM L.

Herbs, semiparasitical, with small greenish flowers, white internally. Flowers hermaphrodite. Perianth with tube connate with the ovary, and 4-5 cleft limb. Stamens 5, rarely 4, with filaments hairy at the base. Ovary inferior, one-celled, with 3 ovules: style filiform with capitate stigma. Fruit a small dry one-seeded drupe. Includes about 100 species, mostly natives of temperate regions of the old world.



THESIUM HUMILE Vahl. Plant annual, with a deep tap root, and many erect angular stems, simple or branched, 1-3 dm. High. Upper leaves linear, one-nerved, about 1 to 3 mm. broad. Flowers in short axillary spike-like racemes, furnished with bracts and bracteoles. Fruit a dry drupe, with longitudinal nerves, like a very small globose tubercle. (A) Mediterranean region, and the region of the Danube. March-April. *Malta*, rather rare, Wied Encita, Pembroke Camp, St Andrews, Delimara, Corradino; *Gozo*, rare, at Xlendi, Madonna tal Kala; *Comino*, rather frequent near Hospital, and along pathway from Hospital to Wied Ernu.

#### BALANOPHORACEAE.

Fleshy herbs, parasitical and leafless, with an underground rhizome growing on the root of the host-plant, and from which arise fleshy scapes, simple or branched, naked or scaly. Flowers monoecious or dioecious, rarely polygamous, densely inserted on the scape, subsessile, forming a globose oblong or cylindrical hear; male and female flowers in the same or in different inflorescence, with peltate scales and rudimentary flowers, and with a single 3-6 lobed perianth. Male flowers usually with 3 stamens, rarely with more, sometimes with only one stamen (*Cynomorium*), sometimes monodelphous, inserted on the perianth. Female flowers with an inferior ovary, one-celled, rarely two-celled, with a filiform style and a terminal stigma, sometimes sessile. Ovule solitary and orthotropous. Fruit dry and coriaceous. Embryo minute, undivided, immersed in a fleshy albumen. The family includes 14 genera, with about 35 species, mostly natives of tropical forests, a few being found in South Africa, one in New Zealand and one in the Mediterranean region.

#### CYNOMORIUM (Mich.) L.

Flowers polygamous in a spadix-like inflorescence; perianth 4-6 lobed (rarely 1-8 lobed), with linear lobes, Stamen only one. Ovary inferior or sub-inferior, one-celled, one-ovuled; style long, with obtuse or truncated stigma. Achene with persistent perianth and style. Includes only one species.

CYNOMORIUM COCCINEUM L. Rhizome branched and squamous, with many thick fleshy stems 1-2 dm. High, dull deep red or purplish black, with ovate adpressed scales. Spadix dense, oblong clavate, formed of short cymes, with bracts and bracteoles. (P) Spain, North Africa, South Italy, Sardegna, Sicily, Candia, Palestine, Arabia, Persia, Canaries. April - May. *Malta*, rather rare, near Casal Dingli on the precipitous cliffs at il Kaus, and Ghallis; *Gozo*, more frequent on the Islet Hagra tal General and on the opposite shore called Gebla tal Altar close to Dueira. Grows as a barasite on the roots of *Inula crithmoides* and of *Obione portulacoides*, not far from the sea. - fungus *Typhoides coccineus* Melitensis Boccone. - *Fucus spicatus coccineus* Melitensis Bonamicus - *Cynomorion coccineum officinarum* Micheili. E. Malta Fungus. I. Fungo di Malta. M. Gherk Sinjur or Gherk il General.

*Cynomorium coccineum*, which of course is neither a fungus nor limited to the Maltese Islands, was first described by Abela, Commander of the Order of Malta, in his "Descrizione di Malta", published in 1647. Bonamico, a Maltese Physician, wrote about it in 1670, and Boccone who had the plant from Bonamico,

described and figured it under the name of *Fungus Typhoides*, in 1674. The Grand Masters of the Order of Malta reserved the exclusive right to collect the plant, and distributed it for medicinal purposes to the hospitals, and also to foreign princes. The Malta fungus was used as an astringent in diarrhoea and dysentery, and as haemostatic. According to Abela it was also used by some people for superstitious and immoral practices. At present it is completely fallen in disuse.

## ORD. POLYGONINAE.

### POLYGONACEAE.

Herbaceous or frutescent plants, often twining, with jointed stems and branches. Leaves alternate, sometimes rosulate, rarely opposite, simple, entire, with revolute margin when young, with a petiole dilated at the base and amplexical, or inserted on a close-fitting membranous stipule or ochrea. Flowers hermaphrodite or diclinous, in the axils of the leaves or bracts, solitary or whorled, forming racemes spikes or panicles, sometimes forming heads, on filiform pedicels or sessile. Perianth herbaceous or petaloid, made of 3-6 segments. Stamens perigynous, usually 6-9, inserted on the base of the perianth, with 2-celled anthers. Ovary one-celled, made of 2-4 carpels, with 2-4 styles, with a solitary orthotropous basilar ovule. Fruit an achene or caryopsis, lenticular or 3-4 gonous, sometimes winged, toothed or spiny, usually covered by the accrescent perianth. Embryo variable, usually in an abundant floury albumen.

The family includes 30 genera with about 600 species dispersed all over the world, the arborescent species being almost peculiar to tropical America.

The Polygonaceae contain oxalic citric and malic acids. *Rumex Acetosa*, *R. scutatus* etc. are cultivated as vegetables for salads under the name of Sorrel. The roots of the Docks, *Rumex Patientia*, *R. crispus* etc. are used as depuratives and antiscorbutics. The Buckwheat (*Fagopyrum esculentum*) is extensively cultivated in North Asia for the abundant flour contained in its seeds, used as substitute for wheat flour. The Rhubarbs are well known vegetables, and roots of *Rheum Rapaonticum*, *R. undulatum*, *R. officinale* etc. furnish the rhubarb root of the druggists, extensively used as colagogue and laxative.

### POLYGONUM (Tourn.) L.

Herbs with hermaphrodite flowers; perianth petaloid or semi-herbaceous, with 3-5 unequal erect segments. Stamens 6-8 inserted close to base of the perianth. Ovary free, unilocular, with 2-3 styles having a capitate stigma. Achene included within the perianth or much exserted, trigonous or lenticular, shining. Includes 152 species distributed all over the world.

**POLYGONUM CONVULVULUS L.** An annual herb, with slender twining or prostrate angular stems, 2-10 dm. Long. Leaves triangular-cordate, sagittate at the base, palminerved, glabrous, acuminate. Ochrea smooth, obliquely cut. Flowers whitish-green on short pedicels, grouped in axillary clusters of 3 to 6, or

forming loose terminal spikes. Style very short, with 3 stigmas. Achenes entirely included within the perianth, rather opaque and granular. (A) Europe, North Africa, temperate Asia, naturalised in North America. May-September. *Malta*, not common, generally met with in gardens and where land is irrigated, as at hamrun, Attard, Lia, Balzan, Msida, Zabbar, Birzebbugia, Burmarrad etc. *Gozo*, rather rare, at Migiarrro and Xlendi. E. Corn-bind, Ivy Bindweed. I. Erba leprina, M. Leblieba hadra.

**POLYGONUM LAPATHIFOLIUM L.** An annual herb with erect or spreading stems, 3-15 dm. Long. Leaves oval-elliptical or lanceolate narrowed at the base, mostly with a large dark spot in their middle. Flowers whitish or rosy-green in compact oblong or cylindrical terminal spikes, mostly erect, sometimes rather loose and very slender (form: *tenuiflorum* Presl.) Ochrea and bracts furnished with short cilia. (A) Almost cosmopolitan. May-October, *Malta*, rare, at melleha Gnien Ingrau, Ghain Zejtuna, Gnien Fieres, Burmarrad, Attard, on irrigated land and in gardens. E. Willow weed.

Var. *Persicaria* L.-*Polygonum Persicaria* L. Plant more slender, with ochrea and bracts furnished with long cilia. Leaves glabrous. *Malta*, with the species at Gnien Ingrau, Imtahleb, Bahria etc. The form: *Incanum* W. with leaves tomentose on the under surface is met with in dryer localities, but always rare.

**POLYGONUM MINUS Huds.** An annual or perennial herb, with many stems erect or prostrate and rooting. Leaves linear-lanceolate, broader at the base and often more or less rounded, glabrous, with ciliated ochrea. Flowers purplish-white, rosy-white or white, in slender spikes usually erect. Perianth usually with 5 segments, not glandular. Achenes biconvex or trigonous, very bright and small. (A) or (P) Europe, Asia, Africa, Australia, New Zealand. The typical form, which is an annual plant, is not known to exist in the Maltese islands. E. Slender Knot-grass.

Var. *serrulatum* Lag. Plant usually perennial, with strong rooting stems erect or diffuse, with more elongated leaves about 10 times as long as they are broad. Ochrea more densely ciliated, and often with longer cilia. Stamens usually 6 to 8, and styles spreading. May-October. *Malta*, in moist places or in streamlets and ditches, at Gnien il Cbir, Imtahleb, Bahria, Gnien Ingrau. Common only at Bahria.

**POLYGONUM AVICULARE L.** Herb annual or perennial usually prostrate, sometimes erect, with slender stems and linear-lanceolate or oval leaves, more or less glaucous. Ochrea brown at the base, silvery above, bifid and lacinate. Flowers in clusters of 1 to 5, in the axils of well-formed leaves, rosy or white, greenish outside, small. Stamens usually 8; styles 3. Achene trigonous, more or less opaque, granulose. (A) or (P) Almost all over the world. April-November. *Malta* and *Gozo*, common along roads, in gardens and fields E. Common Knot-grass. I. Coreggiola or Centinoda. M. Leuza tar-raba.

Var. *Bellardi* All. Plant erect, with erect stems slightly branched. Leaves oval or oval lanceolate, upper leaves almost linear. Flowers in clusters of 2-5 in the axil of bract-like leaves, forming almost a naked raceme, elongated and interrupted.

Achenes large and shining or less opaque. *Malta*, rare, with the species at Marsa, Ghain Tuffieha, San Antonio.

Var. *Depressum* Meissn. *Polygonum herniarioides* Guzz. Non Del. - *P. Gussonei* Tod. Plant prostrate, with radiating short stems with short internodes, and small linear or oval leaves. *Malta*, frequent along roads and in fields along footpaths.

**POLYGONUM MARITIMUM L.** Usually a perennial herb, with a thick woody rhizome, and thick prostrate stems with short internodes and densely furnished with leaves. Leaves somewhat fleshy, elliptical, glaucous with well-marked nerves, revolute at the margin, the floral leaves being slightly narrower and longer. Ochrea very dark at the base, slivery and scarious and laciniate above. Flowers rather large, rosy or whitish, in axillary clusters. Stamens usually 8; styles 3 very short. Achene trigonous, slightly exserted from the perianth. (P) Western Europe, the Mediterranean region, Japan, and North and South America April-July. On sandy sea-shores, rarely on rocky ground close to the sea. *Malta*, St George's bay, ghadira is-safra, Marsa, Saline, Bugibba, Pualet, Melleha, Marfa, Ghain Tuffieha, Gnejna. *Gozo*, rare, at Ramla and Kbajjar. *Comino*, Kala Sta. Maria, where it is common. E. Sea-side Know-weed.

#### EMEX NECK.

Flowers polygamous-monoecious, with herbaceous perianth. Male flowers with 3-6 lobed perianth with spreading segments; stamens 4-6. Female flowers with trigonous 6 toothed perianth becoming urceolate, hard and accrescent in the fruit, with the 3 out teeth recurvd and spiny, the inner 3 teeth being erect and connivent. Ovary free, 1-celled, with one ovule; styles 3 with brush-like stigmas. Achene trigonous, included within the perianth. Includes 2 species, of which one is native of South Africa and Australia.

**EMEX SPINOSA (L).** Campd. Plant branched from the base, with prostrate stems, 2-6 dm. Long. Leaves, petiolate, cordate or truncated at the base, ovate, glabrous, entire, wavy along the margin. Ochrea membraneous and laciniate. Flowers in axillary clusters or small racemes, the lower flowers being female and sessile, the upper flowers being hermaphrodite or male and furnished with pedicels. (A) Mediterranean region. January-May. In fields, gardens and on uncultivated ground. *Malta*, frequent and often common among growing crops. *Gozo* and *Comino*, much less common. *Rumex spinosus* L. M. Selk Xeuuieki, the leaves are sometimes used as salad.

#### RUMEX L.

Flowers hermaphrodite, rarely polygamous or dioecious, with herbaceous perianth, of 6 segments, the 3 outer being small and the 3 inner or valves becoming accrescent and including the fruit. Stamens 6. Ovary and styles u.s. Achene trigonous with hard pericarp. Includes about 100 species, distributed chiefly in the temperate regions of the northern hemisphere.

**RUMEX CONGLOMERATUS** Murr. A herb with perennial rootstock. Radical and lower leaves oblong, rounded or cordate at the base, obtuse or acute at the apex, membranous, often spotted red. Stem 5-10 dm. high, with spreading branches. Flowers in clusters or false whorls in the axil of a leaf, the uppermost being naked, on pedicels as long as the perianth jointed slightly below the middle. Valves of perianth in fruit furnished with thick basilar callus, with entire margin. (P) Mediterranean region as far as the Caucasus, Europe, the Canaries; naturalised in North America. April-June. In valleys, along streamlets and also on dry rocky ground and along roads, in *Malta*, *Gozo* and *Comino*. *Rumex Nemolapathum* Ehrh. - *Rumex acutus* Sm. E. Clustered Dock.

**RUMEX PULCHER** L. A herb with perennial root-stock and spreading branches often prostrate 3-6 dm. high. Radical and lower leaves oblong, obtuse, rounded or cordate at the base, and mostly violin-shaped. Flower clusters or false whorls in the axils of leaves or bracts, the uppermost being naked, forming a large loose panicle. Valves of perianth in fruit oblong, all furnished with callus, but in 2 of them the callus is often indistinct, all with 4-8 short rigid teeth along each side of the margin. (B) or (P) Europe and the whole Mediterranean region, Japan, Canaries, Caucasus, Madeira, naturalised in North America. April-June. Along roads and in fields, not common. *Malta*, Imtahleb, Ghain Rihana, Wied il Kleigha, Gneina, Ghain Mula, etc. *Gozo*, at Migiarro (Zenka), near Chambray and Imgiar ix-Xini. E. Fiddle Dock.

Var. *divaricatus* L. Plant with hairs on the lower part of the stem: petioles and nerves on the lower surface of leaves pubescent or scabrous. Radical leaves mostly not violin-shaped. Branches forming a large panicle. *Rumex pulcher* var. *pubescens* Ambr. *Malta*, rather rare, with the species at Imtahleb and Gneina.

**RUMEX BUCEPHALOPHORUS** L. An annual herb with erect or ascending stem, usually branched from the base, 1-3 dm. high. Leaves petiolate, the lower oval-spathulate or almost lanceolate, somewhat fleshy. Flowers in clusters of 2-3 forming long and slender terminal racemes, naked or the lower part furnished with foliaceous bracts. Ocrea and upper bracts white or scarious. Flower-pedicels jointed near the base, becoming thickened and clavate, concave on the lower surface, reflexed, usually reddish, longer than the perianth. Valves of perianth in fruit elongated triangular, almost without callus, with 2-4 spinous teeth at the base on each side. (A) Mediterranean region, Canaries, Azores. December-May. *Malta*, *Gozo* and *Comino*, very common in fields, along roads and on waste ground. The form: *aculeatus* L, also frequent with the species has the spinous teeth at the base of valves, larger and hooked. E. Red Dock.

**RUMEX LUNARLA** L. A many-stemmed and much branched shrub, about 2 m. high, with persistent oval or roundish somewhat fleshy leaves, cuneate or almost cordate at the base, more or less glaucous, petiolate, entire. Flowers in terminal panicles which are naked, with many loose racemes. Pedicels jointed near the base. (S) The Canaries. April-June. *Malta*, cultivated for ornament, and sometimes naturalised, as at Boschetto - *Rumex polygamus* Cav. E. Tree-Sorrel.

## ORD. TRICOCCAL.

Herbs, annual or perennial, sometimes shrubs or trees; with watery, opaline or milky juice, often acid. Leaves alternate, rarely opposite or whorled, almost always simple, sometimes rudimental in species with fleshy stems. Inflorescence axillary or terminal. Flowers monoecious or dioecious, usually monochlamydeous or achlamydeous. Ovary free, 3-locular, rarely 3-pluriloculus. Fruit usually a trilocular capsule, rarely a berry. Seeds solitary in each cell, very rarely geminate. Embryo straight, enclosed in an abundant fleshy albumen. This large family includes 208 genera, ann about 3400 species distributed all over the world, except in arctic and antarctic regions.

The Euphorbiaceae owe their corrosive and irritant qualities to the acrid juice which they contain, but in many instances the acidity is destroyed or modified by heat. Thus *Manihot utilisima* has a root highly impregnated with a poisonous principle, which dissipated by heat, and the root is thus made to yield a wholesome food (manice). The albumen usually contains a fixed bland oil, while the integuments of the seed may contain a highly poisonous principle, as in the case of the Casor-oil plant. Certain species of *Euphorbia*, native of Africa, such as *E. resinifera*, *E. antiquorum*, *E. canariensis*, *E. officinarum*, with fleshy stems, yield an abundant resinous juice strongly drastic and vesicant *Croton Eleutheria* a shrub of the West Indies, yields Cascarilla bark, a noted aromatic tonic and febrifuge. *Croton Tiglium* of the Moluccas is purgative and drastic, especially the seeds which furnish by expression the well-known Croton-oil. The seeds of *Crozophora tinctoria* are purgative, and the juice of the plant contains a blue colouring principle which turns red in acid solutions and is used under the name of Litmus or Girasol in chemical analysis. Our native *Euphorbias* contain the same irritant and drastic juice, variable in intensity according to the species and season, and the milk of goats which have eaten of these pants is said to acquire irritant and drastic qualities. In this respect one of the worst species is *Euphorbia Chamaesyce* of which three drops of the jice are sufficient to cause a drastic action..Some species, as *Siphonia elastica* and *Hevea braziliensis* furnish an India-rubber of excellent quality.

### TRIBE L - EUPHORBIAE.

Flowers monoecious, in a characteristic inflorescence called a cyathium, consisting of a cup-shaped involucre, which bears along the margin a number of crescent-shaped glandular scales. Inside the cup there are a number of stamens and a stalked gynoeceium, generally situated centrally. The cyathium looks like a single flower, but in reality each stamen represents a male flower, being articulate and having often a scaly bract at the base, while the stipitate gynoeceium is the female flower. Flowers achlamydeous: stamens articulate, ovary stipitate, 3-locular, with one ovule in each loculus.

### EUPHORBIA L.

Inflorescence a cyathium, often grouped in umbels. Involucre of cyathium gamosepalous, with 5 rarely 4 erect lobes, alternating with an equal number of fleshy glandular scales. Stamens many, in 5 bundles, often with a ciliate or laciniate bract at the base. Ovary stipitate, 3-locular, with 3 styles, free or partly adnate, sometimes bifid. Fruit a trilocular capsule, the loculi separating from the axis, each with 2 valves. Includes about 700 species, distributed all over the world, except in frigid regions.

**EUPHORBIA MACULATA L.** An annual plant, with stems prostrate and closely applied to the soil, with woolly hairs. Stems filiform, much branched (5-20 cm). Leaves opposed, hairy, oblong or elliptical, 2-3 mm. long, with a short petiole, somewhat oblique at the base, minutely toothed near the apex, suffused dark red, and generally with a purplish spot on the upper surface. Stipules linear-lanceolate, laciniated. Flowers (cyathium) solitary and axillary, with an almost entire involucre having red glandular scales. Seeds reddish, ovoid and angular, rugose. (A) Native of North America; naturalised in Europe. April-November. Frequent in fields and gardens at Attard, Lia, Musta, Floriana, Boschetto and also in Gozo - *E. supina* Raf. - *E. polygonifolia* Jacq. Non L. this is a comparatively recent introduction in the Maltese Islands. It was first detected by the writer at Attard in 1913, but is fast spreading. *E. Milk Purslane*. *M. Gemmugha hamra*.

**EUPHORBIA CHAMAESYCE L.** An annual plant with the same habit as the preceding, but its stems are more closely applied to the soil. Plant glabrous. Stems very much branched, filiform, 5-20 mm. Leaves roundish or obovate, shortly stalked, opposed, dark green on the upper surface, usually reddish on the lower surface, with an oblique base, crenated towards the apex. Stipules setaceous, bifid or trifid. Flowers u.s. with glands having whitish processes. Capsule keeled. Seeds u.s. greyish. (A) South Europe, North Africa, West Asia, Caucasus. April-November. Very common in fields and gardens particularly on red soils, in Malta and Gozo. *E. Spurge*, *Milk Purslane*. *I. Erba pondina*. *M. Gemmugha*, - *Euphorbia massiliensis* D.C. - *Tithymalus nummularis* Lam.

*Var. Canescens* L. - *var. pilosa* Guss. Plant somewhat hairy; grayish on the upper surface of the leaves. With the species, but rare. Attard, Balzan, Lina and Musta, and probably elsewhere.

*Var. maculata* Parl. Leaves with an irregular purple line or elongated spot on the upper surface along the rachis. Frequent with the species wherever found, and often superseding it.

**EUPHORBIA PEFLIS L.** Plant annual, glabrous and glaucous, with stems prostrate and supine. Stems rather thick and fleshy, dichotomous, much branched and thickened at the nodes (5-25 cm). Leaves opposed, ovate, with a short petiole, with a very oblique base prolonged on one side into a lobe often toothed: for the rest quite entire, but sometimes emarginate at the apex. Stipules awl-shaped, bifid or trifid. Flowers solitary and axillary, with purplish glands. Capsule smooth, with round loculi. Seeds ovoid, smooth, as-coloured. (A) Sandy sea-shores in the Mediterranean region, England, France, Portugal, the Azores and the Canaries. April-November. Sandy beaches and fields close to the sea in Malta, Gozo and Comino. Marsascirocco, Ramla ta San Tumas,

Saline, Ghallis, Ghain Tuffieha, Cneina, Melleha, St Paul's bay and Bahar-ic-Ciaghak, Malta; Cala Sta. Marina in Comino; Ramla, Marsalforno and Kbjjar in Gozo. Nowhere common. *E. Hyssop Spurge* or *Purple Spurge*. The typical form is that usually met with, and has rosy stems and petioles. The form: *viridis mihi*, which is rare (Marfa) is entirely green; and the form: *sanguinea mihi*, also rare (Marfa, Gneina) is entirely red.

**EUPHORBIA BIVONAE** Steud. Plant perennial, woody and shrubby, glabrous and glaucous, branched from the base. Stem erect or ascending, very branched, 2-10 dm. Leaves quite entire, almost sessile, alternate, lanceolate, acute or mucronate. Involucral leaves like the others. Flowers in umbel with about 5 rays, each 2-3 fid. Bracts green or greenish yellow, obovate or spatulate, mucronate. Glands yellowish. Capsule verrucose, 4-5 mm in diameter. Seeds oval, smooth, dark brown furnished with a caruncle. (S) Western North Africa and Sicily. November-June. Malta, at Wied Babu, Wied iz-Zurriek Imtahleb, Casal Dingli, Ta Baldu. Nowhere frequent. - *Euphorbia fruticosa* Riv. Non Forsk.

Var. *papillaris* (Jan) ex Boiss. Plant shorter, with shorter branches and smaller leaves, oval-lanceolate, often obtuse. In the same localities as the species, and more frequent.

**EUPHORBIA SPINOSA** L. Plant perennial, woody, very branched from the base, 1-3 dm., glabrous and somewhat glaucous, with many old dry shoots of former years, very stiff and spine-like. The new shoots are herbaceous at the apex, woody and stiff lower down. Leaves alternate, sessile, lanceolate, obtuse, sometimes mucronate, 5-12 mm. long. The involucral leaves are larger and oval or oblong, and of a lighter green. Flowers in umbels of 1-5 rays, short, simple or bifid. Bracts yellowish, oval or elliptical. Glands roundish, yellow. Capsule u.s. (3-4 mm. in diameter) verrucose with cylindrical or conical-truncated tubercles on its upper part. Seeds u.s. dark red, somewhat compressed, (P) Italy, Sicily, Sardegna, Corsica, Southern France, Dalmatia and Illyria. November -June. Common in Comino; less common in Gozo at nadur, Xaghra, Kala, Migiarro, Ta Harrax, Dabrani etc; frequent in Malta along the southern and western coast, at Wied Babu, Wied iz-Zurriek and Wied Hoxt where it is common, Id-Dikkiena, Dingli, Bahria, Wied Gherzuma, Marfa, Melleha etc.

Var. *melitensis* Parl. - *E. verrucosa Delicata* non L. Leaves obovate-oblong, obtuse or somewhat acute, mucronate. Capsule verrucose, with broad hemispherical tubercles; plant 2½ dm. high, with many dead and spinescent branches. Frequent with the species, and sometimes almost completely replacing it. A variety or form special to these Islands. M. Tenguoud tax-Xaghri.

**EUPHORBIA PUBESCENS** Vahl. Plant perennial, villose, ashy green. Stems erect, with many sterile twigs at the base, herbaceous, simple or branched under the inflorescence. Leaves sessile, closely inserted on the stem, lanceolate or oblong-lanceolate, mucronate, serrated near the apex. Inflorescence an umbel, usually with 5 rays, each trifold and then bifid. Bracts oval or roundish, mucronate. Capsule verrucose and hairy. (P) Mediterranean region and the Canaries. June-August. On or close to irrigated ground. Very rare. Malta, at the Marsa and



Gnien il Gbir; Gozo, at Xlendi. Not collected again anywhere in the last few years. - *Euphorbia pilosa* Auct. Non L.

**EUPHORBIA HELIOSCOPIA L.** Plant herbaceous and annual, more or less glaucous. Stems pubescent or hairy in their upper parts, erect or ascending, simple or branched from the base. Leaves alternate mostly glabrous, obovate-cuneate, somewhat finely toothed rounded or emarginate at the apex; the involucral leaves larger and unequal. Umbel usually of 5 rays, each trifid and then bifid, with obovate, somewhat yellowish bracts. Involucre of cyathium with bifid lobes, and entire roundish yellowish glands. Capsule globose, with 3 deep furrows, green or purplish. Seeds ovoid dark brown, reticulate or alveolate. (A) Europe, North and Central Asia, Japan, Canaries, naturalised elsewhere. Nov-May. Near heaps of rubbish, along roads in fields and on waste lands, very common in Malta and Gozo. E. Spurge, Cat's Milk, Sun Spurge. I. Erba-calenzuola.

**EUPHORBIA PEPLUS L.** Plant glabrous, rather small and weakly. Stem erect or ascending, 1-3 dm., simple or branched from the base. Leaves alternate, with a rather long petiole, entire, obovate or roundish, obtuse or emarginate. Umbel of 3 rays, divided dichotomously. Bracts obtuse oval or rhomboidal. Glands yellowish terminating on each side in a setaceous process. Capsule small, ovate, smooth, glabrous, with 3 furrows. Seeds ash-coloured furrowed or alveolate. (A) Central Europe, Mediterranean region, Azores, Canaries, Bermudas. December-April. Common in fields and waste ground, and especially in gardens, in Malta, Gozo and Comino. E. Spurge. M. Tenguħ tal gionna.

Var. *peplodes* Gouan. - *E. rotundifolia* Lois. Plant smaller, 5-10 cm; glands reddish, with shorter processes. Styles very short or wanting. Seeds smaller. Very common in exposed situations and on arid waste lands.

**EUPHORBIA EXIGUA L.** Plant u.s. Stem u.s., furnished with leaves from the base. Leaves ovallanceolate, or linear, obtuse or acute. Umbel of 3-5 rays, divided dichotomously, with lanceolate bracts broader at the base. Glands yellowish, with prolonged setaceous processes on each side. Capsule smooth, with slightly carinate loculi. Seeds ovoid, dark grey, caruncled, with white tubercles. (A) Central Europe, Mediterranean region, Azores, Canaries. January-May. Common in fields gardens and waste lands, especially in the western Districts of Malta. Frequent also in Gozo, Comino and Cominotto. E. Dwarf Spurge. M. Tenguħda irkika.

Var. *retusa* L. (Cav.) - *E. diffusa* Jacq. Leaves linear truncated or emarginate and retuse. With the species, chiefly in exposed situations.

Var. *latifolia* Strob. Leaves ovate-lanceolate and acute, dilated at the base. With the species in gardens and valleys.

**EUPHORBIA ALEPPICA L.** Plant annual, glabrous, glaucous (1-3 dm.) Stem simple, or branched from the base, becoming denuded of leaves before flowering. Leaves thickly set together, setaceous or narrowly linear, acuminate,

the involucre leaves linear. Umbel of 4-5 rays, irregularly divided; bracts ovate or rhomboid, mucronate or aristate. Glands yellow, with processes on each side. Capsule ovoid or depressed, smooth, with 3 furrows, with slightly keeled loculi. Seeds whitish, ovoid, without caruncle, verrucose. (A) Italy, Western Asia, Greece, Dalmatia, Caucasus, Madeira. May-September. *Euphorbia pinea* All. Non L.-E. *junceae* Ait. - *E. Cupani Delicata* non Guss. Frequent in Malta, at Boschetto, ghirghenti, Wardia, Ghain Tuffieha, Bahria, Corradino, Marsa, Zurricco, Luca, Zebbug etc. Rare in Gozo, Victoria, Ghainsielem.

**EUPHORBIA PINEA L.** Plant annual or perennial, usually glabrous and glaucous, branched from the base, 2-4 dm. Leaves closely set together, rarely fleshy, the lower linear or linear-lanceolate, usually obtuse and mucronate. The upper and involucre leaves lanceolate or oblong, broader at the base, rarely linear. Bracts ovate-reniform or cordate. Capsule ovate-globose, loculi without keel. Seeds ovoid, reddish, with a conical caruncle. (A) or (P) West and South Europe, North Africa, Canaries, Madeira. February-November. Very common in fields along roads and on waste ground, in Malta, Gozo, Comino, Cominotto, Filfola, Selmun - *Euphorbia ragusana* Rchb. - *E. Linifolia et caespitosa* Ten.

**EUPHORBIA TERRACINA L.** Plant annual, biennial or perennial, glabrous and glaucous, (2-4 dm) Stems woody at the base, and branched. Leaves rigid, linear, lanceolate or oblong; the lower leaves narrower at the base, and truncated or emarginate at the apex, the upper leaves broader and mucronate, toothed or scabrous along the margin. Umbel terminal, with 2-5 rays, divided dichotomously. Bracts ovate-triangular or almost cordate, mucronate. Glands yellow and similunar, with a long setaceous process on each side. Capsule globose-depressed, smooth, with 3 deep furrows, with loculi slightly keeled. Seeds ovoid, grey or mottled dark, smooth. (A) or (B) or (P) Mediterranean region, Arabia, Sahara, Canaries, Madeira, Azores. April-September. On sandy beaches, not common. Malta, at Marfa, viz: Ramla tal Bir, Ramla tal Cortin and Ramla tal Armiel, and on the sandy beach at Melleha; Gozo, at Ramla. *Euphorbia italica* Tin. - *E. neapolitana* Ten. - *E. provincialis* Wild.

**EUPHORBIA DENDROIDES L.** Plant perennial, glabrous, woody at the base and shrub-like, ( $\frac{1}{2}$  to 2 $\frac{1}{2}$  m.). Stem branched above, and fleshy. Leaves closely set and persistent at the extremities of the twigs, glabrous, glaucous, linear-lanceolate, obtuse or mucronate, entire. Involucre leaves like the rest. Umbel of 3-8 rays, bifid; bracts roundish mucronate, yellow. Involucre villose externally; glands yellow, emarginate. Capsule smooth, globose, with 3 deep furrows, with loculi somewhat compressed laterally. Seeds ovoid-compressed, dark brown, smooth. (S) *E. divaricata* Jacq. Mediterranean region. December-May. On rocky wastes: frequent at Wied il Ghasel, Wied Filep, Boschetto, Dingli, Gneina, Majesa, Ahrax, Bingemma etc. in Malta, and also in Comino, and in Gozo at Ta Genc, Xlendi, Kala, nadur, San Blas, Migiarro. The form b. involucre Strobl., with green oblong bracts, and an involucre longer than the rays, is met with in the more shaded localities at Wied Filep and Boschetto. M. Tenghoud tas-sigra.

**EUPHORBIA BIUMBELLATA Poir.** Plant perennial herbaceous, glabrous, (5-10 dm)., more or less glaucous. Stem branched with sterile twigs at the base, erect. Leaves set close together, entire or slightly scabrous or toothed along the

margin; the lower linear or lanceolate, obtuse or mucronate; the upper oblong-lanceolate and acute. Umbels two or rarely three, superimposed, with naked stem between them; the upper umbel with 10-25 rays, bifid once or twice. Bracts reniforme. Glands with long, cylindrical, clavate processes on each side. Capsule ovate, granulose, with 3 deep furrows. Seeds oval, wrinkled, furnished with caruncle. (P) Italy, Southern France, Sicily, Corsica, North Africa. *Euphorbia Cyparissias* B. *luxurians* Bert - *E. Cyparissias Delicata* non L. March-June. In fields and waste ground in moist localities; Wied Babu and Marsa, Malta. Rare; not found again for many years.

**EUPHORBIA PARALIAS L.** Plant perennial, herbaceous, glabrous and glaucous, (3-6 Dm.) Stems erect or ascending, branched from the base. Leaves closely set together, coriaceous, imbricate, linear, acute. Involucral leaves ovate-cordiform. Umbels or 3-5 rays, short and twice or thrice bifid. Bracts cordate or reniform. Glands yellow, with short processes. Capsule globose-depressed, with 3 deep furrows, slightly granulose. Seeds globose, greyish white, with a caruncle. (P) Sea shores in the Mediterranean region, and in the Atlantic from Great Britain to North Africa. April-September. Sandy places close to the sea shore. Malta; at Gneina, Marfa, Saline, Melleha, Ramla ta San Tumas. Gozo; Ramla. Comino; Cala Sta. Maria. E. Sea Side Spurge.

**EUPHORBIA CHARACIAS L.** Plant perennial, herbaceous, glabrous and glaucous, much branched and woody at the base, 4-10 dm. Stems thick, erect, with many flowering shoots below the main inflorescence. Leaves closely set together, almost coriaceous, oblong-lanceolate, entire, acute, a little narrower at the base. Involucral leaves ovate-oblong or obovate, hirsute externally. Bracts perfoliate, forming a founded concave structure. Umbel with many rays, bifid once or twice. Glands dark red, with or without processes. Capsule 4-5 mm. in diam., globose-depressed, more or less hairy, with 3 deep furrows. Seeds ovate, greyish, smooth, furnished with a caruncle. (P) South Europe and Asia Minor. January-April. Rocky valleys and wastes. Malta, at Boschetto, dingli, Bingemma, Majesa, Wied il Ghasel, Wied Encita, Wied Gherzuma etc. Gozo, Ta Cenc, Xlendi, Dueira, San Dimitri, Imgiar ix-Xini etc.

Var *melapetala* Gasparr. Umbels with 5-8 rays, with longer bracts, perfoliate u.s. Glands very deep red or blackish, without processes. Leaves less closely set together and usually broader. Capsule sometimes smooth. Plant glabrous, but leaves hairy on the under surface. With the species and usually replacing it in shaded and moist localities. An endemic variety, found also in Western Sicily.

#### TRIBE II-PHYLLANTHEAE.

Flowers monoecious. Calyx of male flowers imbricate in aestivation, and furnished with petals. Anthers erect in the bud, with filaments not jointed. Ovary sessile, with 2 ovules in each cell.

#### ANDRACHNE L.

Plants herbaceous and more or less glaucous. Flowers usually solitary and axillary. Calyx deep 5-partite; disk with 5 scales. Male flowers with 5 petals

shorter than the calyx, and membranous. Stamens 5, connivent at the base over an abortive pistil. Female flowers without petals, Ovary globose-depressed surrounded by the scales of the disk, with 3 loculi and 3 styles deeply bifid. Capsule trilocular, each loculus with one seed without caruncle. Includes 8 species broadly distributed in the tropical and temperate regions of both hemispheres.

ANDRACHNE TELEPHIOIDES L. Plant perennial, glabrous and glaucous, with a woody rootstock. Stems many, filiform, prostrate, usually simple (1-3 dm.) Leaves alternate, ovate or obovate or almost round, about 5 mm. long, of leathery consistence, with a brief stalk, somewhat acute, with a scabrous and narrow cartilaginous margin. Stipules very small, triangular. Flowers axillary, solitary or sometimes in pairs, on a brief peduncle. Calyx with oblong and acute segments, having a narrow whitish margin. Petals lanceolate. Capsule globose-depressed, 3-4 mm. in diameter, with 3-shallow furrows, reflexed at maturity. Seeds trigonous. (P) South Europe, North Africa and Cape Verde Islands, Western Asia, Caucasus and India. March-September. In fields, dry and stony localities, walks of gardens etc. *Malta*, frequent at Attard, Lia, Birchircara, Zurrico, Marsa, Wied Kerda, Wardia, along the railway line, etc. *Gozo*, Gran Castello, Victoria, Via marsalforno, Xlendi, ghainsielem. E. False Orpine. M. Gemmugha bajda.

#### TRIBE III-CROTONEAE.

Flowers monoecious. Calyx of male flowers valvate in aestivation. Petals present in flowers of both sexes. Anthers inflexed in the bud, with filaments not jointed. Ovary sessile, with one ovule in each cell.

#### CHROZOPHORA Neck.

Herbaceous plants usually annual, with flowers in bisexual racemes, having a 5-partite calyx, and 5-lobed disk. Male flowers, with 5 petals a little longer than the calyx; stamens 4-5 with filaments to connivent at the base forming a central column, and with mucronate anthers. Female flowers, usually without petals. Ovary globose, trilocular, with 3 styles deeply bifid. Capsule trilocular, cells bivalved. Seeds without caruncle Species 7, natives of the Mediterranean region, Tropical Asia and Tropical Africa.

CHROZOPHORA TINCTORIA A. Juss. A herbaceous, summer annual, greyish or bluish green covered with scaly or stellate hairs. Stem erect, 1-3 dm, branched above. Leaves alternate, rhomboid or somewhat ovate-rounded, obtuse at the apex, cuneate and with 2 glands at the base, and usually with wavy margin, furnished with a long petiole. Stipules linear and deciduous. Racemes axillary or terminal, the upper 1-12 flowers being male, and subsessile; the lower flowers, 1-4, being female and on long peducles. Segments of calyx linear in the female, and linear-lanceolate in the male flowers. Capsule globose-depressed, tricoccus, covered with scales and tubercles, reflexed, purplish at maturity. Seeds ovoid, trigonous at the apex, rugose. (A) Mediterranean region and Central Asia. May-October, *Croton tinctorium* L. - *Tournesolia tinctoria* O. Kuntze. Frequent and often common in fields, on rubbish-heaps and along

roads; in malta, Gozo and Comino. E. Litmus plant or Girasol I. Tornasol. M. Turnasol.

#### TRIBE IV-ACALYPHEAE.

Flowers monoecious or dioecious, or in unisexual involucre. Calyx of male flowers valvate in aestivation. Petals mostly wanting in both male and female flowers. Anthers erect in the bud, with filament not jointed. Ovary sessile, with one ovule in each cell.

#### MERCURIALIS (Tourn.) L.

Herbaceous plants, annual or perennial, with opposed leaves, and with dioecious or sometimes monoecious flowers. Calyx 3-4 partite. Male flowers grouped in glomerules on interrupted axillary spikes; stamens in glomerules on interrupted axillary spikes; stamens 8-12, of which 1-3 sterile, inserted in the centre of the swollen receptacle, but without disk; anthers biglobose. Female flowers in cymes or clusters, with a well developed disk. Ovary 2, rarely 3-locular. Styles 2, connivent at the base. Capsule globose, with 2, rarely 3, roundish loculi, each with 2 valves. Seeds rugose-alveolate, furnished with a caruncle. Species 7, natives of Europe, North Africa, Western Asia, China and Japan.

MERCURIALIS ANNUA L. Plant annual, branched, glabrous and dioecious. Stem erect (2-10 dm.), quadrangular, thickened at the nodes. Leaves ovate, or ovate-lanceolate, crenate, acute, petiolate, with ciliate margin. Stipules lesiniform. Male flowers with obtuse buds, on spikes longer than the leaves. Female flowers subsessile, 1-2 in the axils of the leaves. Calyx with ovate segments. Capsule with setaceous tubercles. Seeds oval. 2mm. long. (A) Europe, Asia Minor, North Africa, Canaries, Madeira. Nov-May. Very common in gardens, fields, valleys, on heaps of rubbish and along roads, in malta, Gozo and Comino. E. Mercury. I. Mercorella. M. Burikba.

Var. *ambigua* L. Female plants bearing one or more male flowers, mixed with the female flowers. With the typical form, especially late in the season, but rarer.

#### RICINUS (Tourn.) L.

Tree-like shrubs, perennials, but annual in northern countries. Leaves alternate. Flowers monoecious, in bisexual racemes. Calyx 3-5 partite, without disk, with valvate aestivation. Male flowers with many branched stamens, with filaments connivent at the base and inserted on a convex receptacle. Anthers biglobose. Female flowers with trilobular ovary; styles 3 connivent at the base, each usually bifid or bipartite. Capsule trilocular, each cell having two valves. Seeds ovate-elliptical, depressed, with a bilobed caruncle; greyish or more or less coloured red and dotted white. Only one species; probably native of the East Indies, now extensively cultivated in many varieties in most tropical and subtropical countries.

RICINUS COMMUNIS L. Plant glabrous, green or glaucous. Growing stems herbaceous, but older stems and branches woody, (1-5 m.) Leaves large, with a

long petiole, peltate-palmate, with 7-11 acute lobes, serrated. Stipules connivent, forming one amplexicaul stipule, opposed to the leaf and deciduous. Flowers in simple racemes, or somewhat branched, opposed to the leaf, or terminal, with the male flowers below and the female flowers above, on jointed pedicels. Capsule ovate-globose, 3-furrowed, more or less spinescent. Seeds smooth variegated. (A), (B) or (S) The typical form, with green glaucous leaves and stems, and a capsule covered with spinous processes 6-10 mm. is naturalised in Valletta Main Ditch, and around the fortifications, March-October. E. Palma Christi, Castor-oil plant. Ricino, Palma Christi. M. Ricnu.

Var. *africanus* Willd. Stems more branched, twigs thinner, leaves more green and hardly glaucous. Capsule with shorter spines. Naturalised at Pembroke-Camp and around fortifications.

Var. *zanzibariensis* Hort. Stems and leaves reddish green or red with a metallic lustre. Naturalised at Zenka a branch of Wied il Ghasel. This is the sort more often grown for the production of Castor oil.

## CALLITRICHACEAE.

Aquatic herbs, with filiform stems, simple or branched. Leaves without stipules, opposite, sessile; the submerged being often linear, the upper or emerged being oval 1-3 nerved, entire, or forming a rosette, flowers axillary, hermaphrodite or dioecious-monoecious by abortion, solitary and sessile. Involucre wanting or consisting of two small crescent-like, white, opposite bracts. Perianth wanting. Stamens 1, rarely 2, inserted below the ovary, with a long filiform filament, bearing a basifix, one-celled, reniform anther. Ovary sessile, stipitate at maturity, consisting of 2 carpels, each bilobed, forming 4 cells with one ovule in each. Styles with acute stigmas. Fruit somewhat fleshy and indehiscent, 4-celled; seeds with a curved embryo embedded in a fleshy albumen. Includes two genera, each with one or perhaps two species.

### CALLITRICHE L.

The same characters as the family.

Species 1 or possible 2, with many varieties, distributed all over the world, except in South Africa. The plant has no uses.

**CALLITRICHE PALUSTRIS L.** Plant submerged or with its upper part emerged. Stems filiform very thin, simple or branched from the base, forming large tufts; the lower leaves being far apart and the upper leaves set more closely or forming a sort of rosette, entire, linear or oblong or obovate, often emarginate, with 1-3 nerves. (A) or (P) February-April. E. Water Starwort I. Erba gamberaja.

Var. *autumnalis* L. - *C. palustris* var. *bifida* L. Plant entirely submerged. Leaves linear, often broader at the base: upper leaves set closer, but not forming a rosette: all leaves emarginate or truncated with 2 teeth at the apex. Carpels with lobes keeled or winged. In ponds; especially small ponds on the rocky wastes of

the lower coralline formation, at Wied Encita, Wied il Ghasel, St Paul tat-Targia, in Malta: and at Dueira in Gozo. Frequent, but not common.

Var. *stagnalis* Scop. Upper parts emerged and furnished with stellate hairs. Upper leaves always ovate-oblong, and sometimes forming a rosette; the lower leaves may be linear. Carpels u.s. Capsule sessile or subsessile. Malta, according to Gulia.

Var. *verna* L. - Var. *natans* L. - *Callitriche fontana* Scop. - *C vernalis* Kuetz. Upper parts emerged u.s. Lower leaves linear emarginate, with two teeth at the apex; upper leaves obovate, forming a rosette. Carpels obtuse, hardly keeled. Capsule u.s. Gozo, according to Gulia.

Var. *pedunculata* D.C. Upper parts u.s. Upper leaves obovate; lower leaves linear or spatulate. Bracts of involucre wanting. Lower capsules stipitate, higher up subsessile, the upper sessile. Carpels u.s. Gozo, at Ta Cenc, and probably elsewhere.

## ORD CENTROSPERMAE.

### CHENOPODIACEAE.

Herbs or suffrutescent plants. Leaves alternate, rarely opposite, simple, entire, usually glabrous, toothed, sinuate or divided, without stipules. Flowers hermaphrodite, sometimes diclamous or polygamous small, greenish, solitary or variously clustered. Calyx of 5-2 sepals, coherent at the base, sometimes becoming fleshy after flowering. Corolla wanting. Stamens usually hypogynous, usually 5, fertile and opposite to the sepals. Anthers 2-celled introrse. Ovary one-celled, ovoid or depressed, with 2-4 sessile stigmas; ovules campylotropous. Fruit a utricle or a caryopsis, rarely a one-seeded berry. Embryo curved or annular, with copious albumen, rarely exalbuminous.

The family includes 80 genera and about 520 species, distributed all over the world; mostly sea-side plants.

Some Chenopodiaceae are grown as vegetables, such as *Beta vulgaris* (Beet), *Spinacia oleracea* (Winter Spinach), *S. glabra* (Summer Spinach), *Atriplex hortensis* (Orache), *Chenopodium album* Ch. *Viride*, Ch. *Bonus-Henricus* etc. Species of *Salsola*, *Suaeda*, *Salicornia* etc. are seaside plants, rich in alkaline salts, from which supplies of carbonate of soda were formerly obtained.

### TRIBE 1 - ATRICLICEAE.

Plants with continuous stem and with flat membranous leaves. Flowers monoecious or dioecious rarely polygamous. Embryo annular or curved, with more or less abundant albumen.

## ATKIPLEX (Tourn.) L.

Male or hermaphrodite flowers with 3-5 cleft perianth and with 3-5 stamens. Female flowers with perianth reduced to two bracteoles free or partly connate and more or less accrescent in the fruit. Ovary oval compressed, with 2 filiform styles. Utricle membranous included within the bracteoles. Seeds lenticular. Herbs or suffruticose plants with alternate or opposed leaves, often ashy or floury or squamulose. Flowers grouped in sessile cluster forming spikes. Includes about 100 species, distributed in temperate and subtropical regions.

**ATRIPLEX HASTATUM L.** An annual summer herb with erect or prostrate furrowed stem. Leaves green or slightly ashy, or floury; the lower and middle leaves hastate triangular mostly sinuate, toothed along the margin, broad at the base and with a long petiole. Flowers monoecious, rarely almost dioecious. Bracteoles when in fruit, entire or toothed along the margin, more or less triangular, 2-4 mm. long. Flowers in loose spikes, being axillary and leafy at the base, the upper ones, forming a terminal panicle. (A) Europe, temperate Asia, North Africa, Azores, North America, New Zealand. E. Common Orache. I. *Atriplice comune*. M. *Selk il Bahar*. June-November. *Malta*, rather uncommon, at Ta Xbiex, St. George's Bay, Marsa, Marsascala, Pualet, Marfa, Wied Dalam etc. *Gozo*, *Xlendi*; never far from the sea.

Var. *Salinum* Wallr. Plant more or less white and powdery, with prostrate stems. Leaves smaller, fleshy, opposed (form: *oppositifolium* D.C.), or often alternate (form: *prostratum* Bouch.) With the species at Ta Xbiex, Pualet and St George's Bay and Wied Dalam.

Var. *patulum* L. - *Atriplex angustifolium* Sm. Plant mostly white and powdery, with slender prostrate branches and lanceolate or linear-lanceolate fleshy leaves. Spikes mostly erect, more or less dense, with rhomboid or hastate bracteoles. *Malta*, at St. George's Bay near Birzebbugia and at Marfa. *Gozo*, *Xlendi* and near Fort Chambray.

**ATRIPLEX LACINIATUM L.** Plant annual or almost perennial, with erect decumbent or prostrate stems 3-12 dm. long, much branched and often woody at the base. Leaves silvery white especially on the lower surface, the lower often opposed, the upper alternate, with a short petiole, oval hastate, or trilobed, the upper lanceolate hastate. Spikes u.s. leafy at the base of naked. Bracteoles connate and hardened up to their middle, cuneate at the base, rhomboid-hastate toothed along the margin, 3-10mm. long. (A) or (P) Europe, Mediterranean region as far as India, Central and Northern Asia, North America. June-November. The form: *Bocconeii* Guss., of vigorous growth, woody at the base; the lower leaves ovate or rhomboid, sinuous-toothed or trilobed, with spikes dense at the apex and interrupted at the base, belonging to the variety: *tataricum* L. hb., was reported by Gulia from Marsascala.

Var. *roseum* L. Leaves rather large, oval or rhomboid, sinuous-toothed along the margin, not hastate, often suffused pink when young. Spikes usually leafy along the entire length. Bracteoles in fruit rhomboid-triangular. - *Atriplex album* Scop. -



*A. polyspermum* Ten. - *A. foliosum* guss. *Malta*, rare, at Pualet, Ta Xbiex, Kaizenza and St. George's Bay of Birzebbugia, in sandy places or along roads close to the sea. E. Frosted Orache.

**ATRIPLEX PORTULACOIDES L.** A shrubby perennial, woody at the base, 1-4 dm. high, silvery white in all its parts, with woody stems decumbent or ascending. Leaves opposite, fleshy, oval-oblong or lanceolate-linear, obtuse, entire. Flowers monoecious, in spikes forming short naked panicles. Bracteoles in fruit cuneate and connate at the base, swollen and corky, abrupt and with 3 teeth at the apex, tubercled on the outside. (P) or (S) Europe, the Mediterranean region, South Africa, North America. July-December. *Malta*, rare, on rocks and sands close to the sea, at Imtahleb, Casal Dingli, Rdum il Kaus etc. *Gozo*, rare, at Dueira and Hagret il General. It is one of the species which serve as hosts to *Cynomorium coccineum*. - *Obione portulacoides* Moq.- *Halimus portulacoides* Dum. E. Sea Purslane, Purslane Orache.

**ATRIPLEX MOLLE Desf.** An erect, branched, ashy-white shrub, 3-6 dm. high, with alternate fleshy lanceolate leaves, narrowed at the base, obtuse, soft, entire. Spikes forming panicles u.s. Bracteoles in fruit rounded, about 4-6 mm. in diam. Herbaceous or membranous, entire. (s) North Africa and the Canaries. July-October. *Malta*, very rare or accidental, at Xemxija near St. Paul's Bay.

**ATRIPLEX HALIMUS L.** A silvery white or ashcoloured shrub much branched and wood, 1-2m high, with irregular spreading branches. Leaves alternate, tough and somewhat fleshy oblong-obtuse, or almost ovate, entire or toothed at the base, silvery-white. Spikes long and interrupted forming an oblong naked panicle. Bracteoles in fruit reniform or round about 3mm long and 4mm broad, smooth, with a network of nerves on the outside. (S) Mediterranean region, Western France, South Africa, North and South America. July-November. *Malta*, rare, ramparts and ditches of Valletta and Floriana, Gizra, Birzebbugia, St. George's Bay near Birzebbugia, Marsascala, neighbourhood of Notabile. *Gozo*, rare, at Marsalforno on cliffs close to the sea and at Xlendi. E. Broad-leaved Sea Purslane-tree. M. Bianca, haxixa mielha.

Var. *Gussoneanum* Gulia. Spikes short in dense glomerules. Leaves broad, silvery-white. Bracteole in fruit somewhat triangular and verrucose as the base. The plants of Marsalforno (*Gozo*) and Birzebbugia (*Malta*), belong to this variety. Both the species and its variety are often cultivated in gardens for hedges and edgings, and grow well even in very dry or very saline soils.

## TRIBE II - CHENOPODIEAE.

Plants with continuous stem and flat membranous leaves. Flowers hermaphrodite or rarely unisexual, all similar. Embryo annular or curved, with abundant albumen.

## BETA (Tourn.) L.

Flowers sessile, in clusters, furnished with a bract and 2 bracteoles. Perianth 5-cleft, when in fruit closed hardened and 5-ribbed. Stamens 5, perigynous. Ovary partly adherent to the perianth; stigmas 2-3 short, connate at the base. Fruit, a globose utricle enclosed in the tube of the perianth. Seed globose. Includes 8 species, natives of Europe, North Africa and temperate Asia.

**BETA VULGARIS L.** An annual, biennial or perennial plant with hermaphrodite flowers in clusters forming long loose spikes, leafy or not, solitary or in panicles, each flower having 1 bract and 2 bracteoles. Perianth cleft with green herbaceous lobes, tube or perianth becoming hardened, closed and 5-ribbed in the fruit. Stamens 5, perigynous. Ovary adherent below to the perianth; stigmas 2-3 short, ovate or oval-lanceolate. Fruit a globose utricle enclosed in the hardened perianth tube. (A), (B) or (P) In clayey sea-side places or even inland, Europe, Mediterranean region, India, Madeira, Canaries. March-July. E. Red Beet. I. Barbabietola. M. Pitravi.

Var. *perennis* L - *Beta maritima* L. Stems several, prostrate or ascending, 1-6 dm. long, arising from the slender woody root, which is coloured white, yellow or reddish. Flowers solitary or in pairs; stigmas oval-lanceolate. Leaves, small oval or rhomboid, with a long petiole, somewhat fleshy, glabrous or hairy. Common in *Malta*, *Gozo* and *Commino*, on uncultivated ground, along walls of fields, and especially not far from the sea. E. Perpetual Spinach, Sea-side Beet. I. Bieta, Bieta a coste. M. Selk salvagg.

*Beta vulgaris* var. *Cycla* L. - *B. hortensis* Mill, the common garden beet, and *Beta vulgaris* var. *esculenta* Salisb.-*B. sativa* bernh. - *B. Rapa* Dum., the forage and sugar beets, often cultivated, are supposed to be derived from *Beta vulgaris* L. var *macrocarpa* Guss.- *B. Bourgaei* Coss. This last, a native of the Mediterranean region has not yet been found anywhere in these Islands. E. Charg beet. Leaf beet, Wild Beet.

## CHENOPODIUM L.

Herbs with alternate petiolate leaves. Flowers small, greenish, in clusters or cymes, without bracts, sessile. Perianth usually 5-cleft, or 1-3-4-cleft, sometimes becoming fleshy or jicy when in fruit. Stamens 5, rarely less, hypogynous, rarely perigynous. Ovary free, globose-depressed, with 2, rarely 3-4 filiform stigmas. Utricle ovoid or globose, with membranous pericarp, seed with crustaceous testa. Includes about 50 species, mostly native of temperate regions.

**CHENOPODIUM VULVARIA L.** An annual herb, white and powdery, fetid, with cylindrical prostrate or ascending stems, much branched, 2-4 dm long. Leaves oval-rhomboid, petiolate, entire, glabrous powdery and white. Flower clusters in naked axillary or terminal racemes. Perianth when in fruit with adpressed segments. Seeds exserted from the perianth, brown, minutely dotted (A) Europe and the Mediterranean region. April-November. *Malta*, common in fields, gardens and along roads. *Gozo*, less common. E. Dog's Orache, Stinking Goosefoot. I. Brinaiola, Connina. M. Nittiena, ghobbejra or Hobbejra - *Chenopodium olidum* Curt- Ch. FoetidumLam.

**CHENOPODIUM MULALE L.** An annual herb more or less glaucous and white, but not fetid, with an erect or ascending stem, furrowed, branched from the base, 2-5 dm high. Leaves more or less cuneate at the base, dull glaucous green on the upper surface, glaucous or powdery on the lower surface, unequally toothed along the margin, oblong or oval-rhomboid, acute. Flower clusters without bracts, axillary or terminal, these last forming a dense corymb-like panicle. Perianth almost closed when in fruit, with lobes somewhat keeled. Seeds rugose, with an acute margin (A) Almost cosmopolitan. March-November. *Malta*, *Gozo* and *Comino*, common along roads, and on heaps of rubbish near buildings. The form: *pruinsum* guss., with leaves heavily glaucous and powdery on the lower surface is also frequent. E. Nettle-leaved Goose-foot. I. Piede Anserino. M. Ghobbejra or Hobbejra.

**CHENOPODIUM URBICUM L.** An annual herb with erect stem, grooved, 3-10 dm. high. Leaves fleshy, green on the upper surface, somewhat floury on the lower surface, the lower leaves triangular, truncated at the base, acutely and unequally toothed; upper leaves rhomboid, almost entire. Spikes lateral, leafless, except the lowermost spikes, forming long narrow panicles leafy at the base. Perianth 5-cleft, with 5 stamens; perianth in fruit imperfectly closed, with lobes not keeled. Seeds horizontal, with an obtuse margin. (A) Europe, Western and Northern Asia, naturalised elsewhere June- November. *Malta*, Wied Babu, according to Delicata; Valletta glacis. *Chenopodium melanospermum* Wallr. E. Upright Goose-foot. M. Ghobbejra.

**CHENOPODIUM ALBUM L.** An annual herb, with erect angular stems 3-6 dm. high, branched above. Lower leaves oval-lanceolate or oval-rhomboid, more or less whitish and floury, toothed and almost trilobed, acute, the upper oblong-lanceolate, entire. Panicle pyramidal, dense, leafy at the base; spikes dense or interrupted. Perianth in fruit entirely closed, with 5 keeled lobes. Seeds with obtuse margin, shining. (A) Almost cosmopolitan June-October. *Malta*, in irrigated fields, at Wied Gherzuma, Bahria, Ghain Tuffieha etc. E. Bacon-weed, White Goose-foot. I. Farinaccio selvatico. M. Ghobbejra or Hobbejra.

**Var. viride L.** Plant glaucous green, only slightly floury. Leaves often almost all entire. Spikes loose, very interrupted, forming a spreading panicle. With the type at Wied Gherzuma, Attard and Gnien il Cbir. *Chenopodium paganum* Rchb. M. Ghobbejra hadra.

**Var. opulifolium Schrad.** Lower leaves roundish or oval rhomboid, obtuse, nearly trilobed, toothed, glaucous and powdery; upper leaves of same shape but smaller. April-October. *Malta*, common in gardens and fields especially on irrigated ground. M. Ghobbejra or Nittiena.

**Var. amaranticolor Coste et Reyn.** Young leaves and inflorescences of a purplish red. Plant glaucous green and powder, about 1 m. high. Leaves often very large, rhomboidal. Native of Mexico. Cultivated as a potherb, and used as spinach. April-November. Naturalised since 1914 in many gardens, as at San Antonio, Argotti gardens at Attard, Lia etc.

**CHENOPODIUM AMBROSIOIDES L.** An annual herb, with erect branched grooved stem 3-6 dm. high, deep green, pubescent and glandular, with a strong aromatic odour. Leaves with short petioles, oblong or lanceolate, the lower slightly sinuate-toothed, the upper entire. Flowers in clusters forming axillary spikes, often compound and leafy, together forming an elongated panicle. Perianth in fruit closed, lobes not keeled. Seeds smooth, very shining, obtuse at the margin. (A) Native of North and Tropical America, naturalised in many countries. May-October. *Malta*, rare, Wied il Gbir and Marsa. *Gozo*, frequent in Wied il Lunziata and Xlendi. E. Demigod's food, Mexican Tea. M. Ghobbejra te' falz, Ghobbejra tfuh.

#### KOCHIA Roth.

Herbs or suffruticose plants, mostly villous or tomentose, with alternate leaves. Flowers without bracts, hermaphrodite or female. Perianth urceolate, 5-cleft, with an appendix on the back of each lobe when in fruit. Stamens 5, free. Ovary ovoid, with 2 stigmas connate at the base. Utricle depressed, enclosed within the coriaceous perianth, with horizontal seed. Includes about 45 species, natives of Central Europe, Asia, temperate Africa, Australia and North America.

**KOCHIA SCOPARIA (L) Schrad.** An annual herb, with an erect, very branched stem, 5-10 dm high, with fastigiate erect pubescent branches, light green, becoming reddish in autumn. Leaves flat, linear-lanceolate, 3-nerved at the base, ciliated along the margin and nerves. Perianth in fruit, mostly with scale-like processes or tubercles on the outside. (A) Central and Southern Russia; naturalised in many countries. August-September. *Chenopodium scoparium* L. The typical form does not exist in the Maltese Islands.

Var. *tricophylla* (Hort ex Voss.) Leaves narrower, often filiform; stems much more branched and more fastigiate, with shorter internodes, becoming deep red in autumn. *Malta*, cultivated for ornament and often naturalised; San Antonio, Rabato, Marfa, ditches of Valletta and Floriana, Manoel Island etc. E. Brown Goose-foot, Summer Cypress.

#### TRIBE III - SALICORNIEAE.

Leaves with rudimentary blade: branches apparently jointed and knotted. Flowers hermaphrodite, all similar, in catkin-like spikes. Embryo annular or curved with or without albumen.

#### SALICORNIA (Tourn.) L.

Fleshy plants with a saline taste, living not far from the sea, with opposed branches, and leaves opposed and connate and also adherent to the stem like a sheath, terminating above in a ring which gives a jointed appearance to the stem, with 2 small processes on each side which represent the blade of the leaf. Flowers in clusters of 3 in the axil of bracts which are opposed and connate. Perianth utricle-shaped, fleshy, opening anteriorly by a small aperture surrounded by 3-4 small teeth. Stamens 1-2. Ovary pear-shaped; style divided in 2-3 filiform stigmas much exserted. Utricle enclosed in the perianth. Seeds

vertical, red, with hairs hooked at the apex. Embryo conduplicate, exalbuminous. Includes about 8 species natives of sea-side places and inland localities of both hemispheres.

**SALICORNIA HERBACEA L.** An annual or biennial herb, glaucous green. Stems erect or ascending, usually not rooting, 1-3 dm. long, with numerous opposed spreading branches, with cylindrical joints. Spikes cylindrical with short peduncles. Perianth fleshy. (A) or (B) Europe, Central and Western Asia, North and South Africa, North America. June-October. *Malta*, frequent on rocky ground close to the sea, St Paul's Bay, Kaura, Selmun, Melleha, Marfa, Marsascirocco, Marsascala, Sliema, St George's Bay etc. *Gozo*, Kbaijar, Ramla, Xlendi. *Filfolia* - *Salicornia europaea herbacea* L. E. Crab-grass, Marsh Samphire. I. *Salicornia*. M. Almeridja.

The var. *biennis* Afz., with rigid erect stems and branches with spikes 3-6 cm. long, is that commonly met with in the above mentioned localities.

**SALICORNIA FRUTICOSA L.** Plant perennial, suffrutescent, often rooting at the base. Joints of summer stems cylindrical, twice as long as they are wide. Winter stems more or less clavate, the fertile of the same colour as the sterile, and as long or longer. Spikes somewhat clavate, quadrangular when dry. (P) or (S) South and Western Europe, Asia Minor, Arabia, North and South Africa, America. August-October. *Malta*, rather rare, St Paul's Bay, Marsa, Marsascala, Marsascirocco, St. Julian's bahar ic-ciaghak, Sliema. - *Salicornia europaea* var. *fruticosa* L. - *S. fruticulosa* Tin. I. *Salicornia*. M. Almeridja.

#### ARTHROCNEMUM Moq.

Plants with the habit of *Salicornia*, from which they differ principally by the 3-4 cleft perianth. Seeds black, shining, with double testa, the outer being hard and rugose. Embryo incurved, albuminous. Includes about 7 species natives of saline localities in the eastern hemisphere and in North America.

**ARTHROCNEMUM GLAUCUM (Del.) Ung.** A shrubby much branched perennial with woody stems, erect or prostrate and rooting, 8-15 dm. high. The fertile shoots are always much shorter than the sterile; the summer shoots have clavate joints, the fertile shoots being light green and the sterile shoots glaucous green. Spikes thicker than in *Salicornia*, with flowers in a dry state much protruding from their pockets on the joints. (S) Mediterranean region, Arabia, Canaries, Cape Verde Islands, Mexico. May-September. *Malta*, rather rare, at Saline, Marsascala, Marsascirocco, St Julians, Bahar ic-Ciaghak etc. *Gozo*, Cala, Dueira, *Comino*, Cala Santa Maria, San Niclau. - *Salicornia glauca* Del - *S. macrostachya* Moric-Arthrocnemum macrostachyum Moris et Delp.

#### HALOCNEMUM M.B.

Differs from *Salicornia*, by the opposed floral bracts, which are free. Flowers in clusters of 3, with clavate perianth, of 3 free segments. Stamen one. Seed compressed, almost smooth, with membranous testa. Embryo curved. Albumen present. Includes only one species.

HALOCNEMUM STROBILACEUM (Pall.) M.B. A much branched shrub, with twisted branches, mostly opposed, 3-15 dm. high Joints longer in the fertile than in the sterile branches, densely covered with globose abortive buds. Spikes terminal or lateral, oval or cylindrical, up to 27 mm long, with half-round bracts. (S) Mediteranean region, South Russia, Central Asia and Arabia. October-November. In saline localities. *Malta*, at St Julians and Marsascala, according to Delicata and Gulia. *Salicornia strobilacea* Pall.-*S. cruciata* Forsk.-*Holopeplis strobilacea* Ces.

#### TRIBE IV-SALSOLEAE.

Flowers hermaphrodite or polygamous. Embryospiral, with scanty or no albumen. Leaves fleshy, cylindrical or semicylindrical. Branches not jointed.

#### SALSOLA L.

Flowers hermaphrodite, axillary, often solitary, with 2 bracts. Perianth 5-cleft and membranous, with accrescent lobes having a wing-like process on the outer side. Stamens 5, on a glandular ring. Style bifid. Utricle depressed or rounded, papery or fleshy. Seed horizontal with a simple testa. Includes about 40 species, mostly natives of saline localities in the old world.

SALSOLA VERMICULATA L. Plant perennial, sub-frutescent, woody at the base. Stem prostrate or decumbent 3-6 dm. long, with ascending or erect branches, much ramified. Leaves linear or semi-cylindrical, amplexicaul at the base. Floral leaves ovate, mostly scarious along the margin, like the bracts. Flowers solitary, forming spikes. Wing-like process of perianth-lobes greenish white. (S) South Europe and North Africa. August-September. *Malta*, rare, at marsascirocco, Birzebbugia, and on the precipitous cliffs overhanging the sea at Dingli and Bahria. The local plants belong to the typical form which is pubescent, glaucous and yellowish, with leaves up to 1 cm long.

SALSOLA KALI L. Plant annual, herbaceous, erect, branched from the base, glaucous green or redish. Leaves alternate, mucronate-spinescent, linear or semi-cylindrical, fleshy, dilated at the base. Flowers solitary or in clusters of 2-3, forming spikes more or less dense; perianth cartilagineous when in fruit, with obovate slightly reniform wings. (A) Europe, Mediterranean region, Central Asia, North America, Argentina, Azores. June-October. E. Prickly Salt-wort. I. Soda, Riscolo, Erba-Cali. M. Haxixa tar-Rmied.

The typical form has not been reported from the Maltese Islands.

Var. *Tragus* L.- *Salsola Tragus* L.-*S. Kali* var. *glabra* Forsk. Leaves longer and narrower. Wings of perianth in fruit small or abortive; plant glabrous and usually erect. Common on sandy places close to the sea, in *Malta* and *Gozo*.

SALSOLA SODA L. Plant annual and herbaceous, glabrous, fleshy and juicy. Stem erect, branched from the base; lower leaves and branches opposed, the other alternate. Leaves linear-semicylindrical, amplexicaul, rather long, shortly

mucronate, terminating in a hair-like process, not spinescent. Bracts oval-lanceolate, much shorter than the floral leaves. Flowers u.s. in loose spikes. Perianth in fruit large, with accrescent segments scarious and white, with abortive wings. (A) Mediterranean region, Central Europe, Central Asia as far as Japan. June-October. Frequent in sandy or marshy places close to the sea, in *Malta* and *Gozo*. E. Barilla-plant, Salt-plant. I. Riscolo, bacicci. M. Haxixa tar-Rmied.

## SUAEDA FORSK.

Flowers hermaphrodite, mostly in axillary clusters with 1 bract and 2 bracteoles. Perianth with 5 keeled or fleshy segments, without appendices. Stamens 5; style short, with 2 or 3 stigmas. Utricle depressed, membranous. Seed black, smooth with double testa. Includes about 40 species, inhabiting seaside places and deserts all over the world.

SUAEDA FRUTICOSA (L.) forsk. Plant perennial, frutescent, glabrous, with whitish erect stems, much branched, with dense foliage. Leaves alternate, linear semi-cylindrical, up to 1½cm. long, obtuse, fleshy, glaucous green. Flowers small, solitary or clustered, forming dense leafy spikes. Segments of perianth connivent, ovate, dry when in fruit. (S) Western Europe, Mediterranean region, South Russia, East Indies, Arabia, America, Canaries, Madeira. June-October. *Malta*, frequent on rocky ground and in valleys close to the sea, Imtahleb, Marsascirocco, Marsa, Marfa, Gneina, Bahria. *Gozo*, Dueira, Wied Bingemma, Nadur, Xaghra, Xlendi, Marsalforno valley, Kbaijar. - *Schoberia fruticosa* C. A. Mey. E. Sea-Blite, White Glass-wort. M. Suejda, Ghobbejra tar-Rmied.

SUAEDA MARITIMA Dum. An annual plant, herbaceous, glaucous green, glabrous. Stems erect, much branched from the base. Leaves filiform, semi-cylindrical, flaccid, 1-3 cm. long. Flowers in clusters of 2-3, forming long and loose leafy spikes. Perianth swollen then in fruit, with segments slightly keeled. Seeds dotted along the margin. The rest u.s. (A) Europe, Central Asia as far as Japan and India, North Africa, America, Australia, new Zealand, The Canaries. June-October. *Malta*, rather rare, at Ta Xbiex, Marsascirocco, Marsa, marsascala, Gneina, Bahria, Marfa.- *Chenipodium maritimum* L.-*Schoberia maritima* C.A Mey.- *Chenopodina maritima* Moq. E. Sea Blite. M. Suejda, Ghobbejra tar-Rmied.

Var. *Jacquinii* Dum. Stem woody at the base; leaves more obtuse. Flower spikes shorter and more dense. August-October. *Malta*, at Marsascala according to Delicata.

## AMARANTACEAE.

Herbs or suffruticose plants, with opposite or alternate leaves, simple, usually entire, without stipules. Flowers hermaphrodite or diclinous, small, sessile, or in axillary or terminal clusters or heads, each with 3 bracts, rarely 2, the lower being persistent, the laterals scarious and deciduous. Calyx of 3-5 sepals, petaloid or greenish, persistent. Corolla wanting. Stamens 5, hypogynous, fertile, with or

without alternating staminodes. Ovary with 1 carpel and one-celled, with simple and terminal style and capitate or lobed stigma. Ovules one or more, curved. Fruit usually covered by the calyx, a 2- or more seeded utricle, or a caryopsis, rarely a berry. Seeds mostly reniform. Embryo annular or curved, around an abundant farinaceous albumen.

The family includes 48 genera, with about 480 species, natives of both hemispheres. *Amarantus Blitum*, *A. albus* and other species are used as Spinach in several countries. Other species have emollient or astringent properties. The fleshy leaves of *Basella alba*, a twining summer plant, may be used as Spinach. *Celosia cristata*, *C. argentea*, *C. plumosa*, *Gomphrena globosa*, *Amarantus salicifolius*, *A. tricolor* etc. are grown for ornament. *Anredera scandens*, a twining plant of fast growth with tuberous rhizomes, has long been cultivated in our gardens, and is partly naturalised but rarely produces seeds.

### AMARANTUS (Tourn.) L.

Annual plants with alternate leaves. Flowers 3-bracteate, monoecious or polygamous. Perianth usually of 3-5 segments, erect and subequal. Stamens 3-5, free. Ovary with one ovule. Stigmas 2 or 3, sessile and filiform. Utricle membranous, ovate, with 2 or 3 processes at the apex, enclosed within the perianth. Seed black, shiny, lenticular or reniform. Includes about 40 species, natives of temperate and tropical regions.

**AMARANTUS CAUDATUS L.** Stem erect, 3-15 dm. high, glabrous or pubescent, angular. Leaves oval or oval-lanceolate, obtuse, green, somewhat scabrous. Terminal spike very long, thick, pendent; lateral spikes few and short. Flowers in dense clusters, coccineal-red, rarely white; utricle about as long as the perianth. (a) Native of the East Indies, Nubia and Abyssinia. May-October. Cultivated for ornament, and often naturalised in gardens, in *Malta* and *Gozo*. E. Fliramor, Love-lies-bleeding, Velvet-flower. M. Disciplini, Denb id-dib.

**AMARANTUS GRECIZANS L.** Stem green or reddish, angular and grooved, 2-6 dm. high, branched and glabrous. Leaves green, with a long petiole, obtuse or mucronate. Bracts subequal to the perianth, not spine-scent. Segments of perianth green or purplish, keeled, mucronate, half as long as the fruit. Flowers in sessile axillary clusters. (A) Europe, Africa, Asia as far as India and Turkestan. June-October. The typical form, with linear-lanceolate or oblong leaves; segments of perianth thickened at the apex; seeds obtusely keeled along the margin, exists in *Malta* and *Gozo*, but is far less frequent than the variety.

Var. *silvester* Desf. Leaves ovate or rhomboid-elliptical, less than twice as long as they are broad. Segments of perianth not thickened at the apex; seeds acutely keeled. *Malta*, very common in gardens and fields throughout the summer, as at Attard, San Antonio, Lia, Boschetto, Imtahleb, Birzebbugia, etc. *Gozo*, also common, especially in fields and gardens around Rabato M. Ghobbejra hamra.



AMARANTUS RETROFLEXUS L. Stem erect, grooved and striated, hairy. Plant pale green; leaves oval or rhomboid, with a long petiole. Flowers greenish in a dense panicle, with the terminal spike only slightly longer than the laterals. Bracts lanceolate, almost spinescent, twice as long as the female flowers. Segments of female flowers spatulate obtuse at the apex, longer than the fruit. Utricle 2-3 toothed at the apex. Native of North America, naturalised in the Mediterranean region, Central Europe, South Africa etc. April-November. *Malta*, rather rare, on irrigated land, at Gnien il Cbir, Pualet, Wied Gherzuma, Bahria.

AMARANTUS ALBUS L. Stem whitish or yellowish, much branched, slightly angular, glabrous, 2-6 dm. high. Leaves small oval or rhomboid, with a long petiole, obtuse, with a hair-like process at the apex, the upper leaves being oblong-lanceolate. Flowers in axillary clusters forming slender and leafy spikes. Bracts awlshaped, becoming spinescent when the fruit matures, and much longer than the perianth of which the segments are green, oblong lanceolate, half as long as the fruit and finishing in an awn. (A) Native of North America and Mexico. June-October. *Malta*, rather rare, at Marsa, Imtahelb, Wied Gherzuma and Bahria.

AMARANTUS DEFLEXUS L. Stems prostrate, ascending at the apex, green or reddish, grooved, hairy near the apex, 1-4 dm. long. Leaves green, lanceolate or ovate-lanceolate or oblong, obtuse, glabrous, hairy along the nerves on the lower surface, where they are somewhat whitish. Spikes pale green, terminal, simple or branched; flowers in dense clusters. Utricle elliptical. The rest u.s. (A) Mediterranean region, basin of the Danube, Central and Southern Asia, Java, America. June-October. *Malta*, very rare, at San Antonio, fields and gardens at Attard and Lia, Boschetto, Valletta and Floriana Glacis. *Gozo*, rare, gardens and fields at Rabato. - *Amarantus prostratus* Bell. In Balb.-*Euxolus deflexus* Raf. M. Ghobbejra.

## CARYOPHYLLACEAE.

Herbs, rarely suffrutescent plants, with nodose and often jointed stems and branches. Leaves opposite, simple, entire, exstipulate or with small scarious stipules. Flowers actinomorphic, hermaphrodite, rarely unisexual. Sepals 4-5, persistent, free or united into a 4-5 cleft calyx. Petals free, hypogynous, entire or bifid or lacinate, furnished with a naked or appendiculate claw: sometimes small, squamous or wanting. Stamens 8-10 inserted with the petals, with filiform filaments and introrse anthers. Ovary made of 5 or 4 united carpels, sometimes reduced to 3, sometimes borne on a gynophore, one-celled, rarely 2-5 celled. Styles 2-5, free or united into a single lobed or toothed style, stigmatiferous on their inner surface. Ovules 2 or more, rarely solitary. Fruit a capsule, rarely a berry. Seeds numerous, or solitary by abortion, rarely exalbuminous.

The family includes 24 genera with about 800 species, mostly natives of temperate and cold regions of the northern hemisphere, or of cool mountainous regions in the tropics.

*Alsine tenuifolia* and *Sagina procumbens* are used as diuretics and antilithics. *Agrostemma Githago* is poisonous and its seeds possess acrid properties.

#### TRIBE I-ALSINEAE.

Sepals free, or slightly united at the base. Petals without claw or with very short claw, without scales. Carpophore wanting or very short. Stipules often present.

#### SPERGULARIA Pers.

Herbs with spatulate leaves. Calyx 5-parted, scarious along the margin. Petals 5, entire, rarely less than 5 or wanting. Stamens 5-10, rarely less. Capsule 3-valved.

**SPERGULARIA RUBRA (L) Pers.** Plant annual, biennial or perennial, glabrous, or glandular and viscid in its upper parts, with prostrate or ascending stems, numerous and branching, with thickened nodes. Leaves opposed, more or less fleshy, linear, flat-convex, mucronate, often with smaller axillary leaves. Stipules oval-lanceolate, scarious and white. Flowers rosy, or red, or white, in leafy cymes, branching dichotomously: peduncles reflexed when in fruit. Petals not longer than the sepals. Capsule slightly longer than the calyx. Seeds not winged. (A), (B) or (P) Europe, temperate Asia and Africa, America, Australia, New Zealand. February-June. *Malta, Gozo, Comino*, common on cultivated and uncultivated ground and along roads, especially not far from the sea. - *Arenaria rubra* L.-*Lepigonum rubrum* Whltnb. Red Sand-wort, Sand Spurrey. M. *Arenaria*, *Spaccapietra*.

Var. *diandra* Boiss. Plant u.s. Cymes almost leafless; petals slightly longer than the sepals; stamens 2 to 3. Pedicels more than twice as long as the flower. The rest u.s. - *Arenaria diandra* Guss. - *Spergularia salsunginea* Fenzl.- *Spergularia Bocconeii* Foucaud. *Malta*, rather rare, on the glaciis of Valletta and Floriana, Corradino, Luca, marsa. *Gozo*, Xlendi, Masalforno, Wied il-Lunziata, Gran Castello.

Var. *Marina* Griseb. Plant u.s., leaves more fleshy, almost cylindrical. Flowers larger, mostly rosy white in loose leafy cymes. Capsule much longer than the calyx. Seeds mostly not winged: the rest as in the type. *Arenaria rubra* var. *marina* L. - *Spergularia salina* J. et C. Presl. - *Spergularia media* Boiss. *Malta* and *Gozo*, frequent and often common in moist sandy places, especially near the sea.

Var. *media* Pers. Not Boiss. Plant more robust, always perennial. Cymes not leafy, or leafless. Seeds mostly winged. The rest as in the preceding variety. *Arenaria media* L.-*Spergularia heterosperma* Lebel.- Sp. *Marginata* Kit.- *Spergularia salina* Tanfani. In sandy places close the sea. *Malta*, rather rare, Marsa, Kainenza etc. *Gozo*, rare, Cala Dueira, Xlendi, Kbajjar.

#### SAGINA L.

Herbs without stipules and with white flowers. Calyx with 4-5 sepals. Petals 4-5, entire, sometimes reduced or wanting. Stamens 4-5, sometimes 10. Styles 4-5. Capsule 4-5 valved. Seeds reniform rugose. Includes about 8 species, with one exception all natives of temperate and cold regions in the northern hemisphere.

**SAGINA PROCUMBENS L.** Plant prostrate, stems slender, often rooting. Leaves glabrous, mucronate, filiform. Flowers solitary, axillary or terminal, on capillary peduncles longer than the leaves, becoming ecurved after flowering, and afterwards erect. Sepals 4, oval or oblong, obtuse, sometimes apiculate, scarious and white along the margin, spreading in the fruit. Stamens 4-5. Styles 4, much shorter than the ovary. Capsule 4-valved, equal to the calyx or just longer. (A) or (P) Europe, the Mediterranean region, India, Siberia, America, Australia. February-April. *Malta*, *Gozo* and *Comino*, frequent on uncultivated ground, along roads and foot-paths, and especially close to the sea. E. Pearl-weed or Pearl-wort.

Var. *apetala* Ard. Stems ascending not rooting, without a rosette of radical leaves. Plant glabrous or hairy only at the base of the leaves. Peduncles erect or only slightly curved. Petals reduced or wanting. Sepals all obtuse, spreading in the fruit. *Malta*, *Gozo* and *Comino*, very common on cultivated ground, along roads, both inland and close to the sea.

Var. *ciliata* Fr. Plant as in the preceding. Sepals applied to the capsule, the outer 2 mucronate. Frequent with the preceding, in *Malta*.

Var. *maritima* G. Don. Plant glabrous or very rarely slightly hairy, with or without a rosette of radical leaves; stems not rooting. Leaves not mucronate. Peduncles erect. Petals rarely wanting, usually about as long as the sepals; sepals partly spreading in the fruit- *Sagina Rodriguexii* Lojac. Non Wk. *Malta*, *Gozo* and *Comino*, frequent or common in sea-side places.

#### ALSINE L.

Herbs without stipules. Calyx of 5 rarely 4 sepals, scarious and white along the margin. Petals 5, rarely 4 or wanting, entire or slightly emarginate. Stamens 10, rarely less. Styles 3, rarely 2 or 5. Capsule with as many valves. Seeds many, reniform, granulose rarely smooth. Includes about 60 species, mostly natives of temperate and cold regions of the northern hemisphere.

**ALSINE TENUIFOLIA (L) Crantz.** Plant annual; stems slender, erect or ascending, branched dichotomously from the base, 3-15 cm. long. Leaves awlshaped, 3-nerved at the base. Sepals 5, slightly unequal, lanceolate-cylindrical, 3-nerved, with a narrow scarious margin. Petals 5, obovate, about half as long as the calyx, or wanting. Stamens usually 10. Capsule oblong: seeds without ridge. (A) Europe, Mediterranean region, Persia, Afghanistan, Siberia.-*Arenaria tenuifolia* L.-*Minuartia tenuifolia* Hiern. March-June.

Var. *viscosa* Schreb. Plant pubescent and glandular in its upper parts only. Capsule included within the calyx-*Minuartia viscosa* Schinz et Thell. *Malta*, rather rare, on the Valletta glacis (Crocefisso), Marsa, Zurrigo (Nigret), Hagiar Kim and Mnaidra. *Gozo*, according to Gulia.

Var. *arvatica* Guzz. Plant entirely pubescent and glandular. Flowers in dense short cymes or clusters, with pedicels just long than the calyx. *Malta*, rather rare, at Hagiar Kim, Mnaidra, Zurrigo and Marsa- *Arenaria arvatica* Presl.

Var. *confertiflora* Fenzl. Plant entirely hispid and glandular, more or less viscid. Flowers in denser cymes, with pedicels shorter than the calyx.-*Alsine tenuifolia* var. *densiflora* Vis.-*Alsine densiflora* Posp. *Malta*, rare, with the preceding.

ALSINE CENICULATA Strobl. Plant perennial, with prostrate stems, much branched, 1-4 dm. long, with a woody rhizome. Leaves flat, fleshy, with one nerve. Flowers in dichotomous or trichotomous cymes, with pedicels becoming reflexed after flowering. Sepals obtuse, hairy. Petals obovate, equal to the calyx. Stamens unequal. Seeds grooved on the back. (P) South Europe, Northern Africa and the Canaries- *Arenaria geniculata* Poir.-*Arenaria procumbens* Vahl-*Alsine procumbens* Fenzl. Non Crantz.

Var. *procumbens* Fenzl. Petals rosy: the longer stamens equal to the petals, Plant very hairy and glandular; leaves oblong-lanceolate; sepals oval-lanceolate not shorter than the capsule. April-May. *Malta*, rare, at Marfa, Gneina, Rdum Pellegrin, Ghain Tuffieha. Gozo, more frequent, at Dueira, Ramla, Marsalforno, Kbaijar, Ta Cenc etc.

#### ARENARIA L.

Herbs without stipules and with white flowers. Sepals 5, entire or slightly emarginate. Stamens 10. Styles 3 Capsule 6-toothed, dehiscent in 3 valves, each with 2 teeth. Seeds reniform, mostly granular.

ARENARIA SERPYLLIFOLIA L. Plant annual or biennial, minutely pubescent, much branched, erect or ascending. Leaves oval, acute, subsessile, indistinctly 5-nerved. Flowers rather large, with oval-lanceolate sepals; petals half as long as the sepals; capsule ovoid-globose, subequal to the calyx. (A) or (B) Europe, Asia and Africa; naturalised in North America and Australia. E. Sand-wort.

Var. *tenuior* M. et K. flowers smaller, with lanceolate sepals not more than 3 mm. long. Capsule conical. Plant slender, often glandular and viscid in its upper parts.-*Arenaria leptoclados* Guss. March-May. *Malta*, very rare, at Bubakra near Zurrigo.

#### STELLARIA L.

Herbs without stipules and with white flowers. Sepals 5. Petals 5, bifid or deeply parted, rarely wanting. Stamens 10, sometimes less. Styles 3 rarely 5. Capsule deeply 6-valved, rarely 5-valved or 4-valved. Seeds reniform. Includes about 100 species broadly distributed all over the world.

STELLARIA MEDIA (L) Cyr. Plant annual, rarely perennial. Stems dichotomous, diffuse or ascending, 1-8 dm. long, cylindrical, with a line of hairs alternately along one side of the internodes, sometimes entirely hairy or glabrous. Leaves

ovate, the lower petiolate or even almost cordate. Flowers in leafy dichotomous loose cymes. Seeds more or less tubercular. Capsule cylindro-conical, deeply 6-valved. (A) or (P) Native or naturalised almost all over the cold and temperate regions of both hemispheres. January-June. E. Common Chick-weed. I. Budellina, Paperina, Centocchio. M. Harira bajda. *Alsine media* L.

Var. *neglecta* Weihe. Plant well developed, and with robust stems with a line of hairs on alternate sides, rarely entirely glabrous. Corolla slightly longer than the calyx. Seeds rugose.-*Stellaria media* var. *major* Koch. Frequent in fields gardens and valleys in *Malta*, *Gozo* and *Comino*.

Var. *grandiflora* Guss. p p. - *Alsine grandiflora* Ten. Plant still more robust. Corolla about 1/3 longer than the calyx. Seeds with acute tubercles along the margin. Frequent in gardens and moist places, especially in *Malta*.

Var. *pallida* Pire. Plant less developed; stems more slender and much more numerous, with one lone of hairs u.s. or glabrous. Calyx hairy. Petals greatly reduced or wanting.-*Alsine pallida* Dum. Very common in fields and gardens throughout the winter and spring, in *Malta*, *Gozo* and *Comino*.

Var. *apetala* Ucria. Plant less developed, with many slender stems u.s. Calyx glabrous. Petals always wanting. Very common u.s.

Var. *Capaniana* Nym. Plant robust, stems all hairy, at least in the upper internodes. Inflorescence and calyx hairy and glandular. Petals slightly longer than calyx. Stamens 10: seeds large. Leaves broad up to 2 cm. - *Alsine Capaniana* Jord et Fourr - *Stellaria neglecta* var. *glandulosa* Strobl.-*S media* var. *apula* Pallanza. *Malta* and *Gozo*, frequent in gardens and fields in more sunny situations.

**STELLARIA AQUATICA** Scop. Plant flaccid, hairy or glabrous. Stems 3-20 dm. long, slightly angular, very acuminate, the lower petiolate. Inflorescence glandular, leafy, paniced. Pedicels spreading, becoming recurved at the apex. Sepals oval, obtuse. Petals slightly longer than the sepals. Stanien 10. Seeds tubercled. (P) Europe, Western Asia, India, Japan. March-April. *Malta*, very rare, Gharghar and Wied Balluta, in moist places and ponds, according to Delicata. E. Water Star-wort. I. Budellina d'acqua.-*Cerastium aquaticum* L.-*Malachium aquaticum* Fr.

## CERASTIUM L.

Herbs without stipules and with white flowers. Sepals 5, rarely 5, rarely 4, rarely wanting, entire or toothed or bifid. Stamens 10, sometimes less. Capsule cylindrical, often recurved, dehiscent with 6-10 teeth. Includes about 40 species, distributed all over world.

**CERASTIUM BRACHYPETALUM** Desp. Plant hirsute, with erect or ascending stems, 5-30 cm. long. Lower leaves spatulate, the upper oval or oblong. Inflorescence loose. Bracts and sepals herbaceous, sepals entirely hairy, with long hairs. Petals bilobed or bifid, about as long as the sepals or shorter, with

claw often hairy. Stamens 10, with filaments hairy at the base. Seeds minutely tubercled. Pedicels when in fruit 1-3 times as long as the calyx. (A) Europe, Mediterranean region, Siberia. March-April. *Malta*, rather rare, in cool moist places. The plants met with belong to the var. *strigosum* Fr.-*Cerastium brachypetalum* var. *eglandulosum* Fenzl., in which the plant is practically not glandular. E. Mouse-eared Chick-weed.

**CERASTIUM CLOMERATUM** Thuill. Plant u.s. hirsute or hairy, with or without glandular hairs. Cymes at first dense, and then spreading and loose, more or less like a corymb. Pedicels not longer than the calyx. Petals emarginate-bilobed, about as long as the calyx, very rarely wanting. Filaments of stamens glabrous. (A) Almost cosmopolitan. December-April. *Malta* and *Gozo*, common in fields, gardens, valleys, as well as along roads and footpaths.-*Cerastium viscosum* L.-*C. vulgatum* L.

Var. *corollinum* Fenzl. Petals about twice as long as the sepals. Inflorescence dense (form: *conferum* Rouy).

Var. *apetalum* Dum. Petals wanting. Both varieties are frequent with the species.

**CERASTIUM SEMIDECANDRUM** L. Plant u.s. erect or diffuse, hairy and glandular, very rarely glabrous. Inflorescence mostly loose, corymb-shaped. Sepals often toothed at the apex. Petals deeply emarginate or bipartite. Stamens 5-10. (A) Europe, Mediterranean region, Persia, Afghanistan, Japan. December-April. *Cerastium varians* Coss. Et Germ.

Var. *ligusticum* Viv.-*Cerastium campanulatum* Viv. *Cerastium silvaticum* Guss. non W. et K. Petals about twice as long as the calyx. Leaves hairy. Bracts narrowly scarious. Stems hairy and viscid. Plant up to 40 cm. high. Seeds roughly tubercled. *Malta*, rare, on cultivated land and in valleys.

## TRIBE II-SILENEAE

Stipules wanting. Sepals connate. Petals with a long claw, often with a scale or bifid ligule on the throat. Carpophore generally present.

## AGROSTEMMA L.

Calyx coriaceous, with 5 foliaceous lobes. Petals without scales at the throat. Stamens 10. Styles 5, alternate with the sepals. Capsule sessile, unilocular, 5-toothed, many-seeded. Seeds large, tubercled. Embryo annular. Includes only one species.

**AGROSTEMMA GITHAGO** L. Plant annual, with applied hairs. Stems erect single or slightly branched, 3-10 dm. high. Calyx with oval tube, narrow above, hirsute, with lobes falling off in the fruit. Petals half to twice as long as the lobes of the calyx, purple, with obovate emarginate blade. Flowers large, on long peduncles (A) Europe, Western Asia, Siberia, Algeria; naturalised elsewhere. April-May. *Malta*, rare, at Boschetto, Ghirghenti, Attard, in fields between Zebbug

and Wied Encita, usually among growing crops. *Lychnis Githago* Scop.-*Githago segetum* Desf. E. Corn-cockle, Campion. I. Gittaione, Mazzetone.

#### LYCHNIS (Tourn.) L.

Calyx 5-toothed, with 10 nerves, ovoid or clavate. Petals 5, with 2 scales at the throat. Stamens 10. Styles 5, opposed to the teeth of the calyx. Capsule usually sessile, unilocular, sometimes septate at the base, 5-10 toothed, with many seeds. Seeds smooth or tubercled. Embryo curved. Includes about 29 species natives of temperate regions in the northern hemisphere.

**LYCHNIS COELI-ROSA (L) Desr.** Plant annual, glabrous, with erect stems, branched dichotomously above, 2-4 dm. high. Leaves linear acuminate. Flowers large, on long peduncles. Calyx at first oblong-clavate and then ovoid, with 10 ridges, and as many grooves, rugose transversely; teeth lanceolate, acuminate. Petals pink, lighter on the outside, obovate cuneate, bilobed, with acute scales. Seeds tubercled, flat on the back. (A) South Europe, North Africa, Canaries. April-May. Cultivated, and often met with self-sown or naturalised in old gardens, on rubbish heaps etc., ditches of Valletta and Floriana.-*Agrostemma Coeli-rosa* L. Rose-Campion.

#### SILENE L.

Calyx 5-toothed or 5-cleft, with 10-30 nerves, swollen or tubular. Petals 5, rarely wanting, generally furnished with scales. Stamens 10, rarely 5. Styles 3. Capsule stipitate within the calyx, that is furnished with a carpophore, 3-locular at the base or rarely unilocular, many-seeded, dehiscent by 6 valves, rarely by 3. Seeds reniform, granular; embryo annular or curved. Includes over 200 species, natives of North America and of temperate and cold regions of the old world.

**SILENE VULGARIS (Moench) Garcke.** Plant perennial, glaucous, glabrous. Stems erect, simple or branched above, 1-6 dm. high. Leaves often ciliated along the margin. Flowers in dichotomous cymes, pendulous when in flower, often dioecious owing to reduced development of one of the sexes. Calyx oval, glabrous, depressed at the base, toothed, with 20 nerves, whitish or almost purplish. Petals white, rarely light pink, deeply cleft, with 2 lateral scales on the upper part of the claw. Capsule ovoid, with a short carpophore. Seeds tubercled, slightly concave at the sides (P) Europe, Asia as far as India and Japan, North Africa; naturalised in North and South America. March-June - *Cucubalus Behen* L. *behen vulgaris*: Moench 0*Cucubalus inflatus* Salish.-*silene Cucubalus* Wib.-*Silene inflata* Sm. E. White Ben, Bladder Campion. M. Kaskeiza.

Var. *vescicaria* Schrad. Stems erect or ascending, many-flowered. Petals with oblong linear lobes, furnished with two gibbosities on the throat. Capsule ovoid. Plant robust with lanceolate linear leaves, or with narrow linear leaves, (form: *angustifolia* D.C.), or with oval-elliptical leaves (form: *commutata* Guss.), usually glabrous, very rarely hairy on both surfaces (form: *pubescens* D.C.) *Malta*, *Gozo* and *Comino*, frequent along walls of fields, on rocky ground and along roads.

**SILENE BEHEN L.** Plant annual, glaucous, glabrous, with erect branched stems, 2-4 dm. high. Lower leaves pathulate acute, the other oblong or linear lanceolate. Calyx vesicular, oblong, campanulate, narrowing above when in fruit, reticulate, with oval obtuse segments. Petals pink, deeply cleft, claw included in the calyx, with small scales. Capsule oblong, on a short carpophore. Seeds tubercled, flat on the back and on the sides. (A) South Europe, Asia Minor, the Canaries. March-April. *Malta*, rare, in fields at Melleha, Puales and at Ta baldu.

**SILENE SEDOIDES Poir.** Plant annual, usually small, 3-10 cm. high, densely glandular and pubescent. Stems branched and spreading. Leaves fleshy, the lower oblong-spathulate, the upper linear. Calyx tubular, clavate, depressed at the base, with oval obtuse teeth, with indistinct nerves, not more than 3 mm. in diameter when in fruit. Petals small, emarginate, pink, sometimes white, with oblong scales. Capsule oblong, carpophore short. (A) Mediterranean region. March-May. *Malta*, *Gozo*, *Comino* and *Cominotto*, frequent in rocky places close to the sea. E. Catch-fly.

**SILENE SERICEA All.** Plant annual, with silky pubescence, rarely glabrous. Stems erect or ascending, at 3 dm. high. Leaves ciliated at the base, the lower spathulate and petiolate, the upper spathulate-lanceolate or linear. Flowers on short pedicels, usually in simple racemes, sometimes solitary and terminal. Calyx tubular, with applied hairs, clavate when in fruit, with oblong or oval teeth hairy along the margin. Capsule oval, carpophore equal to or longer than the capsule. Seeds large, minutely striated, compressed at the sides, with a deep groove at the back, flanked with a wavy ridge on each side. (A) Mediterranean region. November-June. *Malta*, *Gozo* and *Comino* very common, in fields, along roads, on uncultivated ground, glaxis, plots with shallow soil etc.-*Silene vespertina* Auct. Non Retz. E. Campion, Catch-fly. M. Lsien l'ghasfur.

Var. *decumbens* Riv.-*Silene canescens* Ten. Plant small, decumbent, thickly pubescent. In exposed and dry localities.

Var. *crassifolia* Moris. Plant small, prostrate, with fleshy rounded leaves, and few flowers. In dry places and on rocks near the sea.

Var. *colorata* Poir.-*Silene bipartita* Desf. Calyx shorter, broader, almost campanulate. Flowers occasionally white in plant almost glabrous (form: *albiflora*). In fields among crops.

**SILENE PENDULA L.** Plant annual, more or less pubescent. Stems prostrate-ascending 2-6 dm long. Lower leaves oblong-spathulate, mucronate and petiolate, the upper oblong and lanceolate. Flowers in loose racemes, simple, or if forked without a flower in the bifurcation, on long pedicels, pendulous when in fruit. Calyx vesicular and swollen, not applied to the capsule, clavate, depressed at its insertion, with prominent nerves which are hairy and glandular, with oval or oblong ciliated teeth. Petals pink, large, more or less deeply cleft, with obtuse scales. Capsule ovoid; carpophore short. Seeds tubercled, flat on the sides, convex at the back. (A) South Europe, Western Asia. March-June. *Malta*, rare, Wied Balluta and Calcara. Cultivated in gardens, and often met with



as an escape on the Valletta and Floriana glaxis, sometimes along roads and on heaps of rubbish.

**SILENE NOCTURNA L.** Plant annual, more or less hairy and viscid above. Stems solitary or branched, erect, 1-5 dm. high. Lower leaves spatulate, the upper lanceolate. Lower on short pedicels, forming an erect raceme, almost unilateral. Calyx tubular, not depressed at the base hairy and scabrous, oblong-oval when in fruit, with ciliated teeth, which are lanceolate. Petals bifid or emarginate, exserted, but rather small, white on the upper surface, pinkish on the lower surface. Capsule oblong, sub-sessile. Seeds rugose, grooved at the back, concave at the sides. (A) Mediterranean region, the Canaries: naturalised in North America. February-June. *Malta*, *Gozo* and *Comino*. Common in fields and gardens, along roads and on uncultivated ground. E. Night-flowering Catch-fly. M. Lsien l'ghasfur.

The following forms are met with; form: *lasiocalyx* Soy. Et W. with hirsute woolly calyx; form: *matutina* Presl with petals light pink on both surfaces; form: *mutabilis* L. with lanceolate-linear or linear leaves, narrower than usual, and longer flower pedicels.

**SILENE GALLICA L.** Plant annual, erect, more or less hairy, 1-5 dm. high. Stem simple or slightly branched. Leaves oblong-spathulate or lanceolate. Flowers in racemes almost unilateral, mostly on short pedicels. Calyx tubular, not depressed at the base, oval-oblong and erect when in fruit, with lanceolate acute ciliated teeth. Petals entire or toothed, pale pink, with bifid scales. Capsule conical-ovoid. Seeds rugose or tubercled, almost flat at the back, concave at the sides. (A) Central Europe, Mediterranean region; naturalised in many countries. April-July. *Malta*, rare, Casal Luca and Poor House, in fields. *Gozo*, rare, according to Gulia.

Var. *lusitanica* L. Stems more or less prostrate. Calyx very hirsute spreading when in fruit. *Malta*, rare at the Marsa.

**SILENE VESPERTINA Retz.** Plant annual, hirsute, with erect branched stems 3-6 dm. high. Leaves u.s. Flowers subsessile, in racemes u.s. Calyx tubular, clavate when in fruit, hirsute and glandular, with teeth u.s. Petals pink, deeply bilobed, with bifid crenate scales. Capsule ovoid; carpophore minutely pubescent, as long as the capsule or slightly shorter. (A) South Europe and North Africa. February-July. *Malta*, Wied Hanzir, Wied Balluta; very rare, in fields-Silene hirsuta Poir.-S. hispida Desf.

**SILENE FRUTICOSA L.** Plant perennial, woody at the base, with many shrubby ascending stems, woody below, glabrous or somewhat hairy above where they are herbaceous, 2-5 dm. long. Leaves all mucronate, glabrous on both surfaces, shining on the upper surface, ciliated at the margin, the lower petiolate obovate or obovate-lanceolate, the upper linear-lanceolate. Flowers in a small dense panicle, glandular and viscid, the flowers having short pedicels. Calyx tubular clavate, with acute or acuminate teeth. Petals red or rosy, bilobed, with an exserted glabrous claw. Capsule oblong, conical at the apex; carpophore about as long as the capsule. Seeds rounded and tubercled, grooved at the back, flat

at the sides. (P) South Italy, Sicily, Greece and Grecian Archipelago, Cyprus, Asia Minor, April-June. Gozo, rare, in valleys of Xlendi and Imgiar ix-Xini.

#### SAPONARIA L.

Calyx 5-toothed, more or less ovoid or oblong, with indistinct nerves, or rarely winged. Petals 5, entire or bifid, with or without scales on the throat. Stamens 10. Styles generally 2. Capsule sessile or subsessile, generally unilocular, many-seeded, 4-valved. Seeds roundish, rugose or papillose. Embryo almost annular, surrounding the albumen. Includes about 30 species, natives of temperate regions in the old world.

SAPONARIA VACCARIA L. Plant annual, glabrous, glaucous, with an erect stiff stem, branched corymb-like above, 3-5 dm. high. Leaves connate-amplexicaul, the lower oblong-lanceolate acute, the upper lanceolate acuminate. Flowers many, on rather long pedicels, in a corymb-like inflorescence, light pink or pink. Calyx campanulate pentagonous, with 5 wings, accrescent in the fruit, with acute teeth scarious along the margin. Petals obovate, toothed at the apex. Capsule ovoid, included, about half as long as the calyx. (A) Central and Southern Europe, North Africa, temperate Asia; naturalised elsewhere. March-May. *Malta*, rare, among growing crops of wheat, barley and forages in fields between Attard and "ta Kali".-*Vaccaria pyramidata* Medic.-*V. parviflora* Moench.-*Gypsophila Vaccaria* S. et S. E. Cow-basil, Cow-herb. I. Mazzettino, Cetino.

#### AIZOOACEAE.

Herbs, rarely shrubs. Leaves opposite, alternate or in false whorls, often fleshy, entire or toothed or with cartilaginous margin. Stipules wanting or scarious. Flowers actinomorphic, hermaphrodite, rarely unisexual. Calyx free or adnate to the ovary, 4-5 cleft, persistent, imbricate. Corolla polypetalous or wanting. Stamens perigynous, equal in number to and opposed to the sepals, or indefinite. Ovary rarely one-celled, usually with 2 or more cells, with as many styles as there are cells. Ovules amphitropous, solitary or numerous. Fruit a capsule, or an achene, or a drupe. Seeds albuminous. Embryo curved around the albumen. The family includes 10 genera with about 370 species natives of warm and temperate regions, mostly of South Africa.

#### TETRAGONIA L.

Tube of calyx adnate to the ovary, furnished with spreading tubercles or processes. Corolla wanting. Stamens 16-20, polydelphous, in bundles of 4-5, inserted on the calyx. Ovary divided into 2 parts; the lower part adherent to the calyx, with 8 ovules; the upper part free and sterile or with only one ovule. Styles 8. Fruits a 4-cornered nutlet, with bony endocarp and indehiscent. Includes about 20 species, natives of the southern hemisphere.

TETRAGONIA EXPANSA Murr. Plant annual or almost perennial, fleshy and papillose. Stems prostrate-ascending, 2-10 dm. long. Leaves alternate, oval-rhomboid, with a long petiole, fleshy, flat. Flowers solitary, axillary, subsessile. Segments of calyx oval, green externally, yellowish internally. (A) or (P) Native of

Australia and New Zealand. April-November. Cultivated as a summer spinach, and often naturalised in gardens, on rubbish heaps and along roads in Malta. E New Zealand Spinach. I. Spinaci della Nuova Zelanda. M. Spinaci ta Nuova Zelanda.

### MESEMBRYANTHEMUM (Dill.) L.

Tube of calyx adnate to the ovary, 4-5 lobed. Petals many, linear, inserted on the calyx. Stamens indefinite, inserted with the petals. Ovary inferior, plurilocular, with as many stigmas. Ovules many. Capsule depressed at the apex, where it is dehiscent by fissures. Seeds small. Includes about 300 species, mostly natives of South Africa.

MESEMBRYANTHEMUM NODIFLORUM L. Plant annual, fleshy, papillose, greyish green. Stems ascending 1-3 dm. long. Leaves opposed or alternate, linear, semi-cylindrical or cylindrical, obtuse, ciliated at the base. Flowers small, sessile, axillary or terminal, with petal white, shorter than the calyx. Segments of calyx 4-5, unequal, filiform. Stigmas 5. (A) Mediterranean region, South Africa, the Canaries. April-July. *Malta, Gozo, Comino, Selmun, Filola*; common on rocky ground and sandy places near the sea.-*Mesembryanthemum copticum* L.

MESEMBRYANTHEMUM CRYSTALLINUM L. Plant annual, fleshy, covered with large white crystalline papillae. Stems prostrate or ascending 1-4 dm. long. Leaves ovate, wavy along the margin, the lower petiolate and opposed, the upper alternate or opposed and amplexicaul. Flowers large, subsessile, axillary or terminal. Segments of calyx 5, oval, unequal; petals longer than the calyx. Stigmas 5. (A) or (B) Mediteranean region, South Africa, Australia, California, Canary Islands. March-May. *Malta*, rare, Fort Manoel, St. Julians, Gzira, Kaienza, Ramla ta San Tumas.-*Mesembryanthemum glaciale* haw. E. Ice-plant. I. Erba cristallina. M. Cristallina.

MESEMBRYANTHEMUM ACINACIFORME L. Plant perennial, with angular prostrate stems 6-18 dm. long. Leaves fleshy, more or less falcate, with a triangular cross-section opposed or connate, somewhat glaucous, with a broad cartilaginous keel. Flowers solitary and terminal, large, 8-12 cm. in diameter, always of a purple colour, with compressed peduncles and 2 broad bracts. Calyx segments 5, unequal. Petals long and linear. Stigmas 12-14. (P) Native of South Africa, cultivated and naturalised in many places along the Mediterranean, and in England. April-June. *Malta*, Boschetto, Ballut, near Bighi Hospital, Ghirghenti. Gozo, Xlendi. E. Hottentot's fig, Fig-Marygold. I. Fico degli Ottentotti. M. Xuxet San Gwann.

*Mesembryanthemum edule* L., a glaucous plant much like the preceding, producing usually yellow flowers, and *M. cordifolium* L. f. both natives of Sout Africa, are met with naturalised in gardens and odd corners near old buildings.

## CACTACEAE.

Shrubs or perennial herbs, usually fleshy, with watery or milky juice, usually with jointed fleshy stems with greenbark. Leaves rarely perfect, generally wanting or rudimentary and fugacious. Stipules wanting, buds geminate and superimposed, the lower developing into spines, and the upper is often surrounded by a cushion of hairs or stinging bristles. Flowers actino-morphic, hermaphrodite, axillary and solitary, sometimes terminal. Perianth multiple. Calyx superior, usually petaloid, often indistinguishable from the petals. Corolla made of numerous delicate petals in 2 or more series, distinct or forming a tube. Stamens inserted at the base of the corolla, indefinite, the outer longer, with filiform filaments and 2-celled introrse anthers. Ovary inferior, one-celled, with parietal placentas; with a simple style, and as many stigmas as there are placentas. Ovules numerous, anatropous. Fruit a berry, smooth or spiny, one-celled, umbilicate; albumen wanting or very scanty.

The family includes 13 genera, with about 700 species, with one or two solitary exceptions, all natives of America.

The Cactaceae include no poisonous species. *Cereus grandiflorus* and other species are heart tonics. The fruit of *Opuntia Ficus-Indica* and other species, is eaten. The Coccineal insect is reared on *Opuntia Tuna* Mill, and *Nopalea coccinellifera* Salm-Dyck.

#### OPUNTIA MILL.

Plants fleshy, with jointed flat stems, spinous; leaves rudimentary, cylindrical, fugacious. Calyx with numerous scale-like lobes, in several series. Corolla of several series of petals often connate at the base. Stamens indefinite, in many series, inserted on a concave receptacle. Ovary unilocular, included in the peduncle. Ovules numerous with parietal placenta; style cylindrical with 6-8 stigmas. Fruit a pyriform berry with a concave scar at the apex. Seeds immersed in the pulp of the placenta, with a bony testa. Includes over 100 species, all natives of the warm regions of America.

**OPUNTIA FICUS-INDICA** Mill. A tree, 2-5 m. high, with large flat oval joints, glaucous green. Nodes with only one long spine, caducous and often wanting. Lower joints forming a cylindrical trunk, with age. Fruits large, edible, sweet, yellow, white or red, with stiff pinescent bristles at the nodes. (S) Native of tropical America; naturalised in the Mediterranean region and in warm countries. May-July. *Malta*, *Gozo* and *Comino*, cultivated and often naturalised, especially on the rocky sides of the Xlendi valley in Gozo.- *Cactus Ficus indica* L. E. Prickly-pear. I. Fico d'India. M.Bghajtar tax-xewk, or Bghajtar ta Ghindja.

The following varieties are commonly cultivated: *alba*, bearing white fruits, often streaked yellow or orange (M. Bghajtar Francis); *lutea*, (M. Bghajtar Malti) with yellow fruits often streaked orange, very sweet; *rubra* (M. Bghajtar Inglis), with crimson red fruits; *asperma*, fruits yellow, small, with few abortive black seeds; *pyriformis*, with pear-shaped, large, yellow fruits; *serotina*, with yellow fruits, often nankin or reddish, flowering late and maturing very late (October-November).

*Opuntia maxima* Mill.-*O. amyntoria* Ten., is sometimes cultivated for ornament, and for the sake of its red fruits used in colouring pastry etc.

## PORTULACACEAE.

Herbs or frutescent plants, glabrous, rarely hairy. Leaves alternate or opposed, simple, entire, sessile or subsessile, often fleshy. Stipules usually wanting. Flowers hermaphrodite, mostly actinomorphic and axillary. Calyx 2-5 cleft. Petals 5-3, hypogynous or perigynous, distinct and deltate, often wanting. Stamens indefinite, sometimes reduced to one, inserted on the calyx, with introrse anthers. Ovary sessile, 1-5 celled, with 1 or more ovules in each cell. Fruit a capsule. Seeds with a curved or annular embryo surrounding a floury albumen.

The family includes 15 genera with about 125 species, mostly natives of America and South Africa.

*Portulaca oleracea* is sometimes cooked as salad. The fleshy roots of *Claytonia tuberosa* are eatable.

### PORTULACA (Tourn.) L.

Calyx with 2 sepals connate at the base, where it is adnate to the ovary. Petals 4-6, inserted on the throat of the calyx. Stamens variable from 6 to 16, perigynous. Ovary unilocular, with a central placentation and many ovules. Style 5-8 cleft. Capsule membranous, with transverse dehiscence (pyxidium). Seeds black, reniform. Includes about 16 species, natives of warm regions.

**PORTULACA OLERACEA L.** Plant annual, prostrate, glabrous, fleshy, stems much branched 1-3 dm. long. Leaves fleshy, sessile, oblong or spatulate, opposed, the upper being alternate. Stipules very small. Flowers small, yellow, sessile, in terminal clusters or solitary and axillary or in the bifurcations of the stems. Sepals unequal, petals obovate twice as long as the calyx. (A) Native of Western Asia; naturalised in temperate and warm regions all over the world. May-October. *Malta*, *Gozo* and *Comino*, very common in fields and gardens, throughout the summer, especially on irrigated gardens throughout the summer, especially on irrigated land. Given as green stuff to birds. The variety: *sativa* Haw. With erect stems and larger foliage is sometimes cultivated for salads and to give to birds of song. E. Common purslane. I. *Porcellana*, *Sportellacchia*. M. *Burdlicia*.

## PHYTOLACCACEAE.

Herbs or suffrutescent plants, rarely trees. Leaves alternate, glabrous, simple, entire. Stipules wanting, or geminate at the base of the petiole, deciduous, or persistent and thorny. Flowers hermaphrodite, rarely dioecious, usually actinomorphic, in terminal or axillary spikes, or racemes or cymes. Calyx 4-5 cleft, often coloured on its inner surface. Corolla usually wanting. Stamens more

or less hypogynous, inserted on the base of the calyx on a gynophore, equal in number and alternate with the sepals, or a multiple; rarely indefinite, with introrse 2-celled anthers. Carpels numerous and whorled, rarely solitary, each one-ovuled. Styles lateral and ventral, more or less hooked. Fruit a berry, utricle, nut or samara. Embryo mostly curved, surrounding an abundant floury albumen; rarely exalbuminous.

The Phytolaccaceae have acrid, drastic and vesicant properties. The leaves, roots and unripe berries of *Phytolacca decandra* are strongly purgative. Its ripe berries contain a red juice sometimes used for colouring confectionery, but is injurious.

### PHYTOLACCA (Tourn.) L.

Flowers hermaphrodite or dioecious. Perianth 5-cleft, herbaceous or petaloid. Stamens 10-30, inserted on a fleshy disk, reduced to staminodes in the female flowers. Ovary made of 7-10 carpels, with the same number of styles. Fruit fleshy, depressed, like a berry, with the persistent styles. Seeds one in each carpel, black, shiny, more or less reniform. Includes 10 species natives of tropical and subtropical regions, chiefly in America.

**PHYTOLACCA DECANDRA L.** A perennial herbaceous plant with woody rootstock, 1-2 m. high, glabrous. Stems erect, renewed every year, grooved, dichotomous. Leaves oval-lanceolate with a short petiole, acute, entire, green becoming purplish with age. Flowers white in simple cymes, erect, opposed to the leaves, on long peduncles. Flowers with pedicels up to 1 cm. long, with one bract and two bracteoles. Stamens about 10. Berry purple, made of 8-10 carpels, ridged. (P) Native of North and South America: naturalised in the Mediterranean region and elsewhere. June-October. *Malta*, rather rare, at San Antonio, gardens at Attard and Lia, Boschetto, Ghain il Cbira, ditches and fortifications of Valletta. E. Coakum, Virginian Poke-weed. I. Erba Amaranta, Amaranto. M. Russett, Gheneb id-dib.

*Phytolacca dioica* L.-*Pircunia dioica* Moq., a large tree of fast growth, native of South America, is often cultivated in the public plantations of Malta and Gozo, and is occasionally met with self-sown.

*Rivina humilis* L. and *R. laevis* L., natives of tropical America, are often cultivated as ornamental shrubs in gardens, and are frequently found almost naturalised at San Antonio, Argotti and in gardens at Lia and Attard.

### FRANKENIACEAE.

Herbs with diffuse jointed stems. Leaves opposite, small, entire, exstipulate, often fascicled. Flowers actinomorphic, hermaphrodite, solitary in the bifurcation of branches or in dense leafy cymes. Calyx monosepalous, 4-6 lobed, persistent. Petals free, 4-6, inserted on the receptacle, with a long claw, having a scale in front, pink or violet, imbricate in aestivation. Stamens usually six, sometimes less, rarely more, hypogynous, with extrorse anthers. Ovary free, sessile, 3-4 angled,

one-celled, with a filiform lobed style. Ovules many. Fruit capsule, included in the calyx tube. Seeds albuminous with a straight embryo. Includes only one genus.

#### FRANKENIA L.

Calyx tubular pentagonous, 5-cleft or 5-toothed. Corolla of 5 petals, pink, slightly longer than the calyx, with a grooved scale at the base. Stamens 6, with filaments flat in their lower half. Ovary unilocular, style one, with 3 stigmas. Capsule 3-valved, many-seeded, included in the calyx. Seeds ovoid, slightly rugose. Includes about 12 species, mostly sea-side plants inhabiting both hemisphere.

FRANKENIA PULVERULENTA L. Plant annual, with prostrate stems, much branched, hairy and squamous, 2 dm. long. Leaves obovate, emarginate, flat or only lightly revolute, glabrous on the upper surface, powdery in the lower surface, with a short ciliated petiole, opposed or in whorls of 4. Flowers small, pale pink. Sessile. Calyx glabrous. (A) Mediterranean region, East Indies, Western and Southern Africa and the Canaries. March-July. *Malta, Gozo, Comino, Cominotto* and *Filfolà*, common in sea-side places.-*Frankenia canescens* Presl. E. Mealy Sea-heath.

**MISSING:**

**Frankenia laevis to T.africana 98-100**



Cala Sta. Maria. Often cultivated and planted in sea-side places. E. Tamarisk. I. Tamarice. M. Bruca.

*Tamarix gallica* L., with slender spikes of rosy or pink flowers is also frequently planted in sea-side places, and is often met with self sown at the lower end of Marsalforno valley in Gozo.

## ELATINACEAE.

Herbs or low marshy plants, with creeping or diffuse stems. Leaves opposite, rarely whorled, sessile or sub-sessile, stipulate. Flowers small, actinomorphic, hermaphrodite, axillary, solitary or in cymes. Sepals 2-5. Petals 2-5, hypogynous, with imbricate aestivation. Stamens as many as the petals or double the number, with introrse anthers. Ovary free, 2-5 celled, with 2-5 distinct styles, with capitate stigmas. Ovules numerous, anatropous. Fruit a many-seeded capsule. Embryo straight or curved, exalbuminous. The family includes 2 genera, with about 20 species, distributed broadly all over the world.

## ELATINE L.

Calyx of 2-4 sepals, membranous and obtuse. Corolla of 3-4 petals. Stamens with free filaments. Ovary 3-4 locular, with as many short styles. Capsule globose, depressed, many-seeded. Seeds more or less prismatic, more or less curved, rugose. Includes about 6 species, natives of sub-tropical and temperate regions.

ELATINE HYDROPIPER L. Plant annual, glabrous, slender, with many filiform stems, more or less branched, floating or prostrate, rooting at the lower nodes, 2-5 cm. long. Leaves small, sessile or sub-sessile, 1-3 nerved with small membranous stipules. Flowers solitary, axillary. Petals whitish or flesh-coloured. (A) Europe, Western Asia as far as Siberia, Japan, Algeria, North America, Chili. March-June. E. Water-wort.

Var. *macropoda* Guss. Calyx slightly longer than the petals. Calyx 4 sepals, corolla 4 petals, Stamens 8, styles 4. Capsule 4-valved. Flowers on pedicels 1-5 times as long as the leaves. In ponds, especially on rocky elevated ground. *Malta*, Wied Encita, Wied il Ghasel, Wied Filep, Wied Balluta, Minsija, Boschetto, Tal Ghalia etc. *Gozo*, Xlendi, Ta Cenc, Muciar. All our plants belong to the form: *Gussonei* Sommier, with rosy petals as long as the calyx and seeds much curved, hook-like.

## ORD. POLYCARPICAЕ.

## RANUNCULACEAE.

Herbs, rarely shrubs or climbers. Leaves alternate or radical, rarely opposed, simple or compound, usually with a dilated petiole. Flowers hermaphrodite or rarely dioecious, in various inflorescences. Sepals usually 5, rarely reduced to 3

or indefinite, free, often petaloid. Petals as many as the sepals and alternate with them, rarely more, free, hypogynous, deciduous, furnished with a claw, often wanting. Stamens usually indefinite in many series, hypogynous, with free filiform filaments and with 2-celled anthers. Carpels usually several or many, rarely solitary and rarely coherent, each with a simple style or with sessile stigma. Ovules anatropous, solitary or many in each carpel. Fruit an achene pointed or plumose, or a follicle, rarely a capsule or a berry. Embryo minute, basilar, with a horny albumen.

The family includes 28 genera with about 900 species, distributed all over the world, but rare within the tropics.

Ranunculaceae have acrid properties, any many of them are poisonous. However most species of *Ranunculus* lose their acrid qualities on drying. *Aconitum Napellus*, *A. ferox* and other species are notoriously poisonous, containing aconitine, especially in their roots. The leaves of *Anemone* are vesicant. *Anemone Pulsatilla* is used in diseases of the uterus and of the skin. The seeds of *Delphinium Staphysagiar* are used bruised in ointment as an insecticide. The stems and leaves of *Adonis vernalis* and *A. annuus* contain a glucoside (adonidine) having an action similar to that of *Digitalis*, and is used as a cardiac tonic. Unlike *Digitalis* it has no cumulative action. The seeds of *Nigella sativa* when bruised are strongly scented and were used as emmenagogues, diuretics, and galactagogues. The seeds of *Nigella arvensis* are also aromatic, and are known as black cumin, and were employed as those of *N. sativa*. *Helleborus niger* and *H. viridis* contain helleborine, a powerful poison.

#### TRIBEI-CLEMATIDEAE.

Leaves opposed. Sepals petaloid, valvate or conduplicate in aestivation. Petals wanting or very reduced, without nectaries. Anthers extrorse. Fruit an achene.

#### *Clematis* (Rupp.) L.

Calyx petaloid, made of 4, rarely 5-8, sepals, caducous. Petals wanting or very reduced, passing insensibly into stamens. Stamens numerous, filaments dilated about their middle. Carpels many, free, each finishing in a subulate style. Fruit a head of achenes, each with its accrescent style, usually plumose. Includes about 100 species, natives mostly of temperate regions.

**CLEMATIS CIRRHOSA L.** Stem woody, angular, climbing. Leaves coriaceous, persistent, petiolate, often fascicled, subcordate-ovate, serrated, with other trifid or tripartite leaves having toothed or cut segments. Flowers large, pendulous, solitary, on slender peduncles, furnished with a calyx-like bilabiate involucre, a little below their base. Sepals 4-5, oblong, obtuse or apiculate, yellowish or greenish white, tomentose externally, glabrous internally. Receptacle hairy. Achenes finishing in a plumose style. (S) Mediterranean region and the Himalaya. October-January. *Malta*, on walls, in rocky localities, often climbing on shrubs and small trees: Wied Encita, Wied il Ghasel, Wied iz-Zurriek, Imtahleb, Wied Gherzuma, Wardia, San Martin, Melleha, Boschetto, Fawwara,

Bahria, Ghain il Cbira, Gnien il Chir etc. Gozo, Wied il Lunziata, Xaghra near Ggantija, San Blas, Pergla, E. Spanish Traveller's Joy. M. Kiesha or Bajda.

Var. *balearica* Rich. Et Juss. Leaves soft or only slightly coriaceous, ternatoseptate, with petiolate segments, each trilobed, more or less deeply cut or toothed. With the species in shaded localities.

*Clematis Vitalba* L., cultivated in gardens, is sometimes met with self-sown.

## TRIBE II-ANEMONEAE.

Leaves alternate or radical. Sepals petaloid or greenish, imbricate in the bud. Petals wanting or present, with or without nectaries. Anthers extrorse. Fruit an achene.

### ANEMONE (Tourn.) L.

Leaves radical, variously cut. Flowers with an involucre usually made of 3 leaves or bracts, sometimes very close to the flower and resembling a calyx. Sepals 5-18, petaloid. Petals wanting. Stamens many. Carpels many, inserted on a convex receptacle. Fruit made of a head of achenes with persistent styles finishing or not in a plumose appendix. Includes about 75 species, natives of cold, temperate or mountain regions of both hemispheres, but chiefly in the northern hemisphere.

**ANEMONE HORTENSIS L.** Radical leaves palmate, with 3-5 broad, cut or toothed, segments, and with a long petiole, subcoriaceous, glabrous or hairy; the first leaves having broad rounded lobes acutely toothed; the segments of the others being narrower and acuminate mucronate. Flower-scape 1-3 dm. long. Involucre with free leaflets, entire or bifid or tribid. Sepals 10-15, elliptical oblong or almost linear, more or less hairy externally. Achenes numerous and woolly. (P) South France, Italy and South Eastern Europe. January-March. E. Wind-flower. M. Cahwiela.

Var. *stellata* Lam. Flowers clear violet or pink, rarely white, with 5-18 sepals, elliptical-lanceolate or oblong, rather obtuse. *Malta*, rare, at Wied Babu, Wied Xkora, Wied Ghomor, Ghirghenti, Ghain il Cbira, Boschetto, usually in single specimens.

**ANEMONE CORANARIA L.** Radical leaves ternatopinnatoseptate, with segments divided into narrow and divergent lobes, acutely cut or toothed, broader in the first leaves, hairy on the under surface, usually with a short petiole. Flower-scape 1-2 dm. long. Involucre made of palmatifid leaves or bracts. Flowers 4-8 cm. in diameter, simple or double. Sepals 5-8, broad, obovate or roundish. Achenes numerous and woolly. (P) Mediterranean region January-March. E. Common Anemone, Poppy Wind-flower. I. Anemolo. M. Cahwiela or Anemoni.

Var. *cyanea* Risso. Anthers not apiculate, flowers blue or purplish-blue. In fields, especially on clayey soils, and also on uncultivated ground and in valleys. *Malta*, common, the flowers are gathered in quantities and brought to the flower-sellers

at Valletta. *Gozo*, on calyey soil around Xaghra and Nadur, round Chambray, marsalforno and Dabrani. *Comino*, at kala Sta. Maria.

The varieties: *coccinea* Jord., *albiflora* Rouy, and *Mouansii* Henry, are cultivated, and are occasionally met with self-sown in gardens.

#### ADONIS L.

Leaves radical or cauline. Sepals 5, rapidly caducous. Petals 3-20, with a flat claw and without a nectary. Fruit made of a head or a spike of achenes, rugose or reticulate, with a persistent, beak-like style. The rest as in *Anemone*. Includes 3 or 4 species, natives of temperate and mountainous regions of the eastern hemisphere.

*Adonis ANNUS* L. Plant annual, with an erect angular stem, 1-5 dm. high, hairy below. Lower leaves petiolate, the other sessile, all bipinnatoseptate, with pinnatifid segments, lobes narrowly linear, short or long, mucronate. Flowers 15-30 mm. in diam. red, rarely orange or yellow, on long peduncles. Petals 3-10, often with a black spot at the base, entire or corroded along the margin. Achenes ovoid-trigonous, rugose-reticulate, mostly with a straight beaked style. (A) Europe, the Mediterranean region as far as the Caucasus; naturalised in North America. January-May. In fields and among growing crops, and also in valleys, along roads and on uncultivated land. *Malta* and *Gozo*, common. *Comino*, frequent. The flowers are sold by the flower-sellers. E. Pheasant's eye. I. Adonide, Fior d'Adone. M. Ghallet is-Serduk, Ghain is-Serduk or Henna.

Var. *microcarpus* D. C.-*Adonis Cupanianus* Guss.-A. *baeticus* Lojac. non Guss. Sepals glabrous, achenes in a rather loose spike, gibbous at the base of the style, without a toothed circular ridge. Mediterranean region, and the Canaries. This is the variety commonly met with in these Islands. A yellow-coloured variety (form: *citrina* Guzz.) is met with here and there, but is uncommon. A rare form has orange-coloured flowers (form: *aurantiaca* Mihi.)

Var. *intermedius* Webb et B.-A. *dentatus* Lojac. Differs from the preceding by the very dense and rather short spike, made of achenes having a circular toothed ridge about their middle. *Malta* and *Gozo*, frequent with the preceding.

Var. *tripetalus* Mihi. Plant more robust and spreading. Flowers usually with only 3 petals, small, and of a dull brownish red. *Malta*, very rare, in fields among sula and wheat.

#### RANUNCLUS L.

Herbs with flowers often in cymes, on one-flowered peduncles. Sepals 5, rarely 3 or more than 5, caducous. Petals 5 or rarely 6-10, with a nectariferous pit on the claw. Stamens 5 or many. Carpels usually many, on a globose or conical receptacle. Fruit made of a head, usually globose, of smooth or rugose or tubercled achenes, terminating usually in short beak-like persistent style. Includes about 160 species, distributed all over the world.

**RANUNCULUS AQUATILIS L.** Plant annual or perennial, floating or terrestrial, with floating stems with more or less long internodes in the floating forms, or with short erect or creeping stems having short internodes in the terrestrial forms. Leaves with an amplexicaul petiolar sheath, furnished with two short and broad stipule-like processes at the base. Lower leaves always sessile, the upper sessile or petiolate. Peduncles opposed to the leaf or axillary, one-flowered, curved when in fruit. Petals whitish with yellow claw. Receptacle more or less hairy. Achenes rugose transversely, glabrous or hispid. (A) or (P) Almost cosmopolitan; chiefly in stagnant water. January-June.

Subspecies: *diversifolius* Gilib. (often considered as distinct species). Floating leaves petiolate, broad, 3-5 lobed or cleft: submerged leaves bi-trichotomously cut in filiform or setaceous segments. E. Water Crowfoot.

Var. *pertatus* Schrank. Leaves with the sheath adnate to the petiole for its lower two-thirds. Petals 1-3 times as long as the sepals, with a yellow claw. Floating leaves deeply cordate or subtruncated at the base, with 5 lobes crenate or entire. *Malta*, in ponds, at Wied Encita, St Paul tat-Targia, and possibly elsewhere. The form: *truncatus* Koch., with leaves truncated at the base, is frequent in ponds in many places.

Var. *Baudotii* Godr. Differs from the preceding by its larger flowers, the petals being about 3 times as long as the sepals, and by the floating leaves being less deeply lobate.- *Ranunculus aquatilis* var: *grandiflorum*. Grooves.-*R. macranthus* Tod. Common in ponds, especially on rocky ground, in *Malta*, Gozo and Comino.

Subspecies: *peucedanifolius* All. (often considered as a distinct species). Leaves all submerged or almost submerged; all bi-trichotomously cut in filiform or setaceous segments. Petals with a yellow claw.

Var. *trichophyllus* Chaix.-*Ranunculus divaricatus* Schrank-*R. pantothrix* Brot. Leaves with soft short divergent segments, forming a round general outline, and they keep this outline even when taken up from the water. Receptacle oval or almost conical, hirsute. Flowers small, about 1 cm. in diameter. Jan-May. *Malta* and Gozo, frequent in ponds, in rocky places and also in valleys, as at Wied il Ghasel, Ghain Rihana, Wied is-Seuda, Kleigha etc.

Var. *fluitans* Lam.-*Ranunculus fluviatilis* Weber. Leaves with long segments, forming an oblong outline; all sessile. Flowers larger. Receptacle globose or oval, usually glabrous. February-May. *Malta*, in ponds; usually in ponds along valleys, with water flowing slowly, as at ghirghenti, ghain il Cbira, Ghain Rihana etc. but less frequent. Gozo, valleys of Dueira and Xlendi. E. Eel-beds, Eel-ware.

**RANUNCULUS OPHIOGLOSSIFOLIUS Will.** Plant annual, erect or ascending 3-50 cm. high, glabrous or hairy in its upper pars. Leaves oblong or ovate, the lower cordate-oval or roundish; the middle leaves oval; the upper oblong or lanceolate; all except the uppermost, petiolate; entire or toothed. Flowers small, on long peduncles, opposed to the leaves or in the bifurcations. Petals only slightly longer than the sepals. Achenes small, subcompressed, granulose or

scabrous, rarely almost smooth, furnished with a very short beak. (A) Mediterranean region, the Canaries, the Caucasus. March-April. *Malta*, rare, in ponds at Ghain Rihana and Ghain Mula-Ranunculus uliginosus Ten. E. adder's-tongue Spear-wort.

Var. fontanus Presl. Plant annual or perennial. Mostly prostrate-ascending and rooting. Achenes smooth. The rest u.s. *Malta*, very rare, in ponds at Ghain Mula.

RANUNCULUS FICARIA L. Plant perennial, glabrous, a shining green, with fascicled tuberous-fleshy roots, more or less clavate. Leaves mostly radical, oval-cordate or rounded-cordate, fleshy, shining green, with a long petiole entire or angular-crenate often with a dark purplish spot at the base. Flowers solitary, 1-3 cm. in diameter on long peduncles. Sepals 3, very rarely 4 to 5. Petals oblong-lanceolate, shining yellow, with the claw furnished with a nectariferous scale. Achenes oval, swollen, pubescent, with sessile stigma. (P) Europe, the Mediterranean region; naturalised in North America. January-April. *Malta* and Gozo, frequent, sometimes common, in fields, along roads, and especially in moist valleys - Ficaria verna Huds.-F. ranunculoides Roth. Butter-cup, Crow-foot, Small Celandine. I. Favagello. M. Fomm il Gheliem.

Var. grandiflorous Strob. - Ficaria grandiflora Rob. Ranunculus Ficaria v. calthaefolius Guzz. Plant stronger with larger leaves, with stems more often branched. Flowers 3-5 cm. in diameter. Achenes hirsute. *Malta*, rare, at Wied Encita, Boschetto and Wied il Ghasel.

RANUNCULUS BULLATUS L. Plant perennial, hairy and hirsute, with fascicled fusiform roots. Leaves all radical, forming a rosette, obovate or elliptical, petiolate, roughly and unequally toothed, more or less rugose and bullate. Peduncles leafless, 3-15 cm. long, one-flowered. Flowers rather large, shining yellow: sepals 5; petals narrowly obovate. Achenes glabrous with recurved beak. (P) South Europe and North Africa. October-February. *Malta*, Gozo and Comino, very common on uncultivated ground, along roads, and especially on the Valletta and Floriana Glacis, the Cottonera lines etc.- Ranunculus rhombifolius Jord. Et Fourr. M. Cifollok.

The form: semicalvus Jord. Et Fourr. With leaves almost glabrous on the upper surface or only slightly ciliated, is frequent with the species. The form: plenissima with very pretty flowers perfectly double is met with here and there, but is very rare.

RANUNCULUS FLABELLATUS Desf. Plant perennial, with small oval tuber-like roots. Leaves pubescent on the lower surface, and generally also on the upper surface, with rigid applied hairs; first leaves rounded or oval, roughly toothed or subtrilobed; the other leaves trilobed, with cuneate bifid or trifid segments with linear or oblong laciniae. Cauline leaves few, with linear segments. Sepals villous, spreading or reflexed. Petals 2 or 3 times as long as the calyx. Achenes forming an ovoid head, half-oval, minutely granular or hair, with a straight beak very rarely curved; (P) Western Europe, the Mediterranean region as far as India. March-May, *Malta* and Gozo, frequent in arid rocky localities, as near ta

Baldu, Boschetto, tal Ghalia, Misrah Suffara etc. (Malta), and Xaghra, Nadur, Ta Cenc etc. (Gozo).- *Ranunculus chaerophyllus* L. p.p.-*R. insularis* Viv. The typical form is not met with; but only the variety: *dimorphorrhizus* Brot.-*Ranunculus chaerophyllus* var: *vulgaris* Moris-*R. flabellatus* v. *acutlobus* Freyn, in which the first leaves dry before the flowering period, and the leaves are very villous with linear or lanceolate segments.

**RANUNCULUS BULBOSUS L.** Plant perennial, robust, with fibrous fascicled, partly fusiform roots. Stem often thickened at the base like a bulb, 15-60 cm. high, villous with applied or erect hairs. Leaves more or less hairy, often spotted with white, tripartite or triseptate or ternate, with petiolate segments, the median segment having a longer petiole, rarely all sessile, and all more or less cut into lobes or toothed laciniae. Sepals reflexed. Achenes smooth, usually with hooked beak. (P) Europe, the Mediterranean region; naturalised in America. April-May. The typical form is not met with in the Maltese Islands. E. Butter-cup, Butter Daisy.

Var. *macrophyllus* Desf.-*Ranunculus corsicus* D.C.-*R. paluster* Moris. Plant more robust, 3-10 dm. high, with broader leaves, having sessile segments. Flowers large, 2-4 cm. in diameter. Sepals spreading or almost reflexed. Achenes large. *Malta*, frequent and often common in certain valleys, as at Wied Encita, Ghirghenti, Imtahleb. The large flowering form growing at Wied Encita, with flowers about 4 cm. in diameter, has been called *macranthus* by Sommier and Caruana Gatto.

**RANUNCULUS SARDOUS Crantz.** Plant usually annual, with fibrous roots, fascicled but not tubercled. Stems more or less leafy, branched corymb-like or even almost simple, erect, only slightly thickened at the base. First leaves oval, lobate-crenate or trifid; the next being trifid or triseptate, with petiolate segments cut or toothed; the cauline leaves progressively smaller. Flower-stalks grooved. Sepals reflexed, usually hairy. Petals usually twice as long as the sepals, deep yellow. Plant glabrous or hairy. Achenes usually tubercled. (A) or (P) Europe, the Mediterranean region, the Canaries; naturalised in North America. February-June. *Malta*, very rare: ditches at Floriana. *Ranunculus Philonotis* Retz.

Var. *trilobus* Desf. Plant annual, usually glabrous, with spreading branches. Flowers small, pale yellow, with petals just longer than the sepals. Achenes small and tubercled. *Malta*, also rare, Floriana glacis near Blata il Bajda.

**RANUNCULUS PARVIFLORUS L.** Plant annual, yellowish, hairy and soft. Stems ascending, 1-4 dm. long. Radical and lower leaves cordate or round, trifid, with obtusely lobed segments; upper leaves trilobed or entire. Flowers small on peduncles usually curved and smooth, opposed to the leaves or terminal. Petals pale yellow, sometimes reduced to 1-3. (A) Western Europe, Mediterranean region, Canaries, Australia, new Zealand; naturalised in North America. March-April. The typical form is not known to exist in these Islands.

Var. *Chius* D.C.- *Ranunculus Schraderianus* F. et M.- *R. incrassatus* Guss. Peducles shorter and clavate at the apex. Petals narrowly oblong. Beak of

achenes longer and broader. *Malta*, very rare; in moist places at Ghain Rihana according to Delicata.

**RANUNCULUS MURICATUS L.** Plant annual, glabrous or slightly hairy. Stem 1-5 dm. high, usually branched corymb-like. Leaves rounded, cordate, or broadly truncated at the base, 3-5 lobed, with crenate lobes: upper leaves very cuneate, 3-lobed, or lanceolate. Flowers small, distributed along the stems, on straight grooved peduncles which become elongated when in fruit. Petals just longer than the sepals. Achenes broadly keeled, with subulate thorns, curved or hooked; beak curved. Receptacles almost glabrous. (A) Mediterranean region, as far as India; the Canaries; naturalised in America and Australia. February-May. *Malta*, *Gozo* and *Comino*, in cool localities, in fields and on uncultivated ground, frequent and often common.

**RANUNCULUS ARVENSIS L.** Plant annual, rarely biennial, slightly hairy, with a tap-root. Stem erect 1-5 dm. high. Leaves ternate, with petiolate segments, or the lower deeply trifid, all with lobes cut into lanceolate or linear laciniae. Flowers pale yellow, on long slender smooth peduncles. Sepals hairy, spreading. Petals about 1/3 longer than the sepals. Receptacle hispid. Achenes 4-8, broadly keeled, beak almost straight and linear. (A) Europe, Mediterranean region, India; naturalised in North America. April-May. In fields and also on uncultivated ground. *Malta*, frequent here and there, but not common. *Gozo*, at Nadur and Xaghra. In the form: *spinosus* Neillr., the achenes have long curved thorns; in the form: *reticulatus* Schm. Et Reg., the achenes have reticulated nerves, but neither thorns nor tubercled. The first form is the most frequent. E. Devil's Claws, Hedge-hog.

### NIGELLA (Tourn.) L.

Sepals 5, petaloid, caducous. Petals 8, narrowing at the base into a horn-like nectariferous claw, bilabiate, the lower lip being bifid. Stamens many, connective broad. Carpels 3-10 sessile, whorled, connate at the base, each finishing in a linear style. Fruit made of follicles partly connate in a capsule, furnished with the persistent styles. Seeds in 2 series, oval-angular. Includes about ten species, natives of the Mediterranean region and Central Europe.

**NIGELLA DAMASCENA L.** Plant annual, glabrous, with an angular simple or branched stem, 1-4 dm. high. Leaves pinnate-multifid with divergent linear segments, which are broader in the lower leaves, scabrous along the margin. Flowers solitary, terminal, sessile 12-40 mm. in diameter, surrounded by an involucre of 5 leaves much longer than the sepals. Sepals 5, spreading, oval-lanceolate, narrow at the base, pale blue. Stamens many. Capsule large, smooth, with 3 to 5 follicles each divided into two cells of which the outer is sterile, connate up to the apex, forming a globose swollen capsule. Seeds rugose. (A) South Europe as far as Crimea, North Africa, Canaries, Madeira. March-May. *Malta*, *Gozo* and *Comino*, frequent and often common, especially on uncultivated land, rocky wastes, and in valleys. E. Love in a mist. I. Damigella, Fanciullacce, Scapigliate. M. Siek il brimba. The form: *africana* Brand, only 2-5 cm. high, rarely with more than one flower, which is smaller than in the typical form, is frequent in dry rocky localities.



## DELPHINIUM (Tourn.) L.

Sepals 5, petaloid, the upper prolonged at the base into a spur. Petals 4, sometimes connate and reduced to one; the upper two shaped like a nectarium and prolonged in a spur which penetrates into the spur of the calyx; the lower two not spurred. Stamens many. Carpels one or three, free, sessile, finishing in a persistent style, and later on becoming follicles. Seeds in 2 series. Includes about 40 species, natives of temperate regions in the northern hemisphere.

**DELPHINIUM AJACIS L.** Plant annual, with an erect stem, slightly ramified, hairy. Leaves ternate with lobes cut into many linear segments. Flowers large in long spike-like racemes, blue, rarely rosy or white, with the bracts of the lower flowers leaf-like. Follicles pubescent, with beak about 2mm. long. Seeds black, with circular wavy wrinkles. (A) Mediterranean region, Mesopotamia, the Canaries, Madeira; naturalised in South America. April-June. *Malta* and *Gozo*, cultivated in many varieties for ornament, and often met with self-sown, especially near gardens, sometimes almost naturalised.-*Consolida Ajacis* Schur. E. Larkspur. I. *Speronella*, *Fior-cappuccio*. M. *Piedidaluett*.

**DELPHINIUM PEREGRINUM L.** Plant annual, with an erect stem branched above. Leaves small, with a short petiole, trifid, each lobe with many linear segments; upper leaves and floral leaves linear and entire. Flowers small, in loose spike-like racemes. Sepals 5, petaloid blue or bluish violet, the upper with a spur about 15 mm. long. Upper petals emarginate. Follicles glabrous or pubescent. Seeds small, many, round, umbilicate, with circular wrinkles. (A) Mediterranean region, the Caucasus, Madeira. May-September. E. Larkspur. I. *Speronella*. M. *Siek il Hamiema*.

Var. *halteratum* S. et S. Plant more or less pubescent. Leaves with rather broad segments. Racemes more or less dense. Petals abrupt or even cordate at the base, much shorter than their claw. *Malta* and *Gozo*, frequent in fields, as well as on uncultivated land and in valleys.

Var. *longipes* Moris. Plant almost glabrous and more or less glaucous; leaves with narrow or linear segments. Racemes rather short and dense. Flowers deep blue, slightly shaded violet. Pedicels longer than the spur. *Malta*, rare, at *Kajenza* (*Birzebbugia*).

**DELPHINIUM STAPHYSAGRIA L.** Plant annual, robust, with an erect villous stem 5-15 dm. high, slightly branched above at the inflorescence. Leaves large, pubescent or almost glabrous, with a long petiole, palmate, with 5-9 broad lobes, oblong-lanceolate, cut in the lower leaves, entire in the upper. Terminal raceme long, the laterals rather short. Pedicels with 2 bracteoles at the base. Sepals at first greenish and then blue or dirty blue, hairy, the upper sepal with a short obtuse spur. Follicles pubescent. Seeds few, large, trigonous, black, reticulate-alveolate. (A) Mediterranean region, Canaries, April-May. *Malta*, rare, *Boschetto*, *Ta Baldu*, *Wied Babu*, *Ghirghenti*, *Marsascala*, *Wied il-Ghasel*. E. *Stavesacre*, *Louse-wort*. I. *Stafisagria*. M. *Zerrighet il Kamel*.

## LAURACEAE.

Trees and shrubs, rarely parasitic herbs (*Cassytha*). Leaves alternate, simple, usually entire, coriaceous and persistent, without stipules, dotted with glands. Flowers hermaphrodite or diclinous, small, actinomorphic, white yellow or green, in axillary cymes or forming various inflorescences. Perianth simple, consisting of a monosepalous calyx, 6-cleft, rarely 4-9 cleft, with lobes in 2 series, and with a persistent tube forming a ring or cup at the base of the fruit. Stamens inserted on the calyx, in 2 series, as many as the lobes of the perianth, or a multiple, alternately fertile and sterile. Anthers 2-celled, with calvular dehiscence. Ovary one-celled, with one anatropous ovule. Fruit a drupe or berry. Seed solitary, embryo straight, exalbuminous.

The family includes 34 genera and about 900 species, mostly natives of tropical and subtropical regions.

The leaves of *Laurus nobilis* L. are used for their aroma, to flavour dried figs, and also in sauces etc. The wood and the root-bark of *Sassafras officinale* Nees et Bern., are used as sudorifics. The bark of *Cinnamomum zeylanicum* Bray., of Ceylon and other tropical countries, is the well-known cinnamon which is used as a condiment and as a tonic and stimulant. *Cinnamomum Camphora* L. (*Camphora officinarum*), of Formosa furnishes the true camphor of commerce, and *Dryobalanops Camphora* Colebr., is the source of borneol or Borneo camphor. *Persea gratissima* the avocado-pear, is a luscious and nourishing fruit of the West Indies. *Nectandra rodiei* Schomb, of West Africa furnishes the bebeeru bark, used as stomachic, tonic and febrifuge. The leaves of *Pneumus Boldus* Mol., of Chili are used as diaphoretic and diuretic.

### LAURUS (Tourn.) L.

Flowers dioecious, with a 4-cleft deciduous perianth. Male flowers with 8-12 stamens in 2-3 whorls, with biglandular filaments: anthers dehiscing by means of 2 valves which open from below upwards. Female flowers with 4 sterile stamens, with biglandular filaments. Ovary one-ovuled; style with 3-lobed stigma. Fruit a drupe, with seed enveloped in a papery cover. Includes 2 species, one of which is limited to the Canary Islands.

**LAURUS NOBILIS L.** A glabrous evergreen tree, with oblong or lanceolate coriaceous leaves, shortly petioled and wavy along the margin. Flowers yellowish, in axillary umbels of 4-6, on rather short peduncles furnished with bracts. Drupe oval or elliptical, black at maturity. (S) Mediterranean region. February-March. *Malta*, Boschetto, Ghain il Cbira, San Martin, Wardia, Gneina, Ta Baldu, Addolorata Cemetery etc, often cultivated and naturalised. *Gozo*, Xlendi, Nadur, E. Bay tree, Noble laurel. I. Alloro. M. Rand.

Var. *sphaerocarpa* Mihi. Leaves smaller, usually obtuse and not wavy along the margin. Fruits smaller and roundish. At Boschetto, Ghain il Cbira, San Antonio, rare.

Var. *angustifolia* Mihi. Leaves linear-lanceolate or linear, long, mostly obtuse. At Boschetto; rare.

## ARISTOLOCHIACEAE.

Perennial herbs, often with twining stems; leaves alternate simple, mostly entire, usually cordate, petiolate, petiole often dilated at the base; without stipules, but often with one or two small axillary leaves. Flowers hermaphrodite, axillary or terminal, usually solitary, often foetid. Perianth simple, reduced to the calyx, tubular, irregular or polymorphic, with the tube swollen above the ovary into an utricle enclosing the stamens. Stamens usually 6, epigynous and gynandrous, inserted at the base of the style, sessile or subsessile. Ovary inferior, with several cells, each with several anatropous ovules. Fruit a capsule, rarely a berry. Seeds albuminous, with a minute embryo.

The family includes 5 genera with about 200 species, distributed all over the warmer regions of the world, mostly in the northern hemisphere.

The roots of *Aristolochia longa* and *A. Pistorchia* were used as excitants in asthma and chronic catarrh. *Aristolochia Clematitis* is poisonous, and is used sometimes as soporific, but is highly dangerous. The leaves and rhizome of *Asarum europaeum* are very acrid, the leaves were used powdered as sternutatory, and the rhizome as emetic and cathartic.

### ARISTOLOCHIA (Tourn.) L.

Perianth tubular, irregular, deciduous, ventricose at the base, and finishing in a lateral appendix. Anthers 6, sessile, inserted around the style. Ovary inferior, with 6 cells, each with many ovules; style short with 6 stigmatic lobes overhanging the anthers. Capsule coriaceous, pendulous, septicidal. Seeds compressed and winged. Includes about 180 species, natives of tropical and temperate regions.

**ARISTOLOCHIA LONGA L.** Root tuberous and vertical, fusiform and then cylindrical, 10-40 cm. long. Stems many, often branched 20-40 cm. long, slightly twining. Leaves broadly oval, obtuse or emarginate, with a long petiole very dilated and excavated at the base. Peduncles about as long as the petiole. Perianth yellowish green streaked purple, with a purplish brown appendix about 1/3 the length of the tube. Capsule obovate or pear-shaped. (P) South Europe, Austria and the region of the Danube Asia Minor, Canaries, Madeira. April-May. *Malta*, very rare, Wied Babu, Wied iz-Zurrieck, Wied Ghomor, Wied Hreijef, Mghatab, Wied id-Dis. E. Birth-wort.

The plant has a perennial root or rhizome, with a spreading habit, throwing up annual stems about 2 dm. long. Flowers are produced freely, but capsules are comparatively rare.

## ORD. RHOEADINAE.

## RESEDACEAE.

Herbs annual or perennial, rarely shrubby. Leaves alternate, simple, with minute gland-like stipules. Flowers zygomorphic, hermaphrodite, in a raceme or spike, furnished with bracts. Calyx persistent 4-8 cleft, with equal lobes, imbricate in aestivation. Petals alternate with the lobes of the calyx, 4-8, rarely 2 or wanting, hypogynous, entire or cut, rarely coherent. Stamens 3 or more, usually inserted within the disk, not protected by the petals in aestivation, with 2-celled introrse anthers. Ovary sessile or stipitate, 2-6 carpelled with as many cells or one-celled, usually with many ovules, or with 1-2 ovules in each cell. Ovules usually campylotropous. Fruit a capsule, indehiscent, closed or open at the top, rarely a berry. Seeds reniform, exalbuminous, with a curved or convolute embryo.

The family includes 6 genera with about 66 species natives mostly of the Mediterranean region as far as India, only 3 being natives of South Africa.

The root of *Reseda lutea* and *R. alba* was used as aperient sudorific and diuretic. *Reseda lutea* yields a yellow dye.

## RESEDA L.

Sepals 5, rarely 4-7; petals usually same number as sepals, with a scale-like claw, and with a lacinate limb. Stamens 10 or more, free, inserted on a disk which is broader on the upper side. Ovary unilocular, formed by the fusion of 2-4 carpels, each terminating in its style with a fissure on its inner side. Placentae 3-6 parietal. Capsule widely open at the apex, where it is 3-4 lobed, and rugose or bullate on its sides. Seeds many, smooth or rugose. Includes about 53 species, distributed u.s. except South Africa.

**RESEDA ALBA L.** Plant annual or perennial, glaucous green. Leaves all deeply pinnate, with 3-5 pairs of irregular linear lanceolate lobes, acute, more or less decurrent, scabrous and whitish along the margin. Flowers in dense conical racemes. Sepals 5, very rarely 4 or 6. Petals 5, white, longer than the calyx, trifid. Capsule oblong cylindrical. Seeds granulose scabrous. (A) or (P) Mediterranean region; naturalised in western Europe, India and South Africa. December-May. *Malta*, *Gozo* and *Comino*, very common in fields of sulla, on rocky and uncultivated ground, old walls etc.-*Reseda suffruticulosa* L. E. White Mignonette. I. Erba ruchetta. M. Denb il haruf.

Var. *incisa* Ten. Leaves with 8-10 pairs of lobes, alternately large and small, all very wavy along the margin.-*Reseda undata* Ten. Non L.-*Reseda alba* var. *Tenorii* A. Terr. Common, especially in fields among growing crops.

Var. *Hookerii* Guss. Plant pale yellowish green. Leaves with slender, grooved lobes, often falciform, wavy along the margin.- *Reseda fruticulosa* b. *glaucescens* Guss.-*R. alba* var. *maritima* Muell. Frequent on rocky ground, in valleys and near the sea-coast. Plant always perennial and bushy.

RESEDA LUTEA L. Plant annual or biennial, bushy, somewhat scabrous, with prostrate or ascending stems, 2-6 dm. high, angular or slightly grooved. Leaves with long petioles, the lower simple lanceolate or spathulate, the other trifid, with bifid lateral lobes and terminal lobe often trifid, decurrent, scabrous and whitish along the margin. Flowers in long terminal conical racemes, often somewhat loose. Calyx of 6-7 sepals, rarely of 5 sepals. Petals 6, yellow or greenish yellow, of which the laterals are shorter than the calyx and bifid, the upper 3 being trifid, and the lower entire. Seeds smooth and shining. (A) or (B) Central Europe and the Mediterranean region. *Malta*, frequent and often common, especially at Melleha and Marfa; *Gozo*, at Imgiar ix-Xini, Nadur, and Xaghra. *Comino*, in several places. Usually on rocky wastes or along old walls, rarely found in fields. E. Base Rocket. I. Guaderella crociata. M. Denb il haruf isfar.

Var. *mucronata* Tineo.-*Reseda mucronulata* Guss. Plant more scabrous, with longer racemes. Leaves with acuminate-mucronate lobes. Capsule with more acute teeth. With the species at Melleha, Marfa and Bahria in *Malta*, and at Imgiar ix-Xini in *Gozo*, also in *Comino*.

RESEDA PHYTEUMA L. Plant annual, biennial, or perennial, with busy stems, erect or ascending, 1-30 cm. long, scabrous and angular. Leaves petiolate, simple lanceolate-spathulate, often trifid or trilobed, or the upper leaves ternate with a larger middle leaflet. Flowers in loose racemes, more or less conical or obtuse. Calyx accrescent. Petals 6, yellowish white or greenish white, the 4 upper with 4 or more lobes, the lower 2 entire and very narrow. Capsule oblong-ovate, with 3-4 short teeth, pendulous when ripening. Seeds rugose. (A), (B) or (P) Mediterranean region and Central Europe.

Var. *odorata* L. Calyx not accrescent. Flowers very sweet-scented. Seeds smaller than in the typical form. Cultivated, and often met with self-sown in moist localities or on heaps of rubbish in the neighbourhood of gardens. E. Mignonette. I. Amorino. M. Resedan.

## PAPAVERACEAE.

Herbs annual or perennial rarely suffrutescent, usually with milky or coloured juice. Leaves alternate, simple, toothed or pinnatifid; with terminal inflorescence, rarely cymose or paniced. Flowers actinomorphic, hermaphrodite. Sepals 2, rarely 3, free or rarely coherent free, usually 4, rarely more or wanting, with a convolute aestivation. Stamens hypogynous, rarely perigynous, free, indefinite, in many series, rarely reduced to 4-6 in one series, with filiform filaments and 2-celled anthers. Carpels forming an ovoid or oblong one-celled ovary, with perietal placentae: style short or wanting, with connate subsessile persistent stigmas, radiating on the surface of a disk formed by the styles, with many anatropous ovules. Fruit a capsule, or a one-celled siliqua, variously dehiscent. Seeds numerous, rarely solitary. Embryo minute, basilar, with a copious oily albumen.

The family includes 20 genera, with about 150 species, mostly natives of temperate and subtropical regions in the northern hemisphere.

Papaveraceae contain an acrid and narcotic juice. Opium is the inspissated milky juice obtained by incision from the immature capsule of *Papaver somniferum*. The petals of *papaver Rhoeas* are used as a slight sedative. *Chelidonium majus* has a yellow juice, which is acrid and is used for destroying warts and corns; it has a strongly rubefacient action.

#### CHELIDONIUM (Tourn.) L.

Herbs with a yellow-orange juice. Sepals u.s. Petals 4 contorted in the bud, obovate. Stamens in 3 rows, of which the inner and outer consist of 8, and the middle row of 4. Ovary bicarpellary, unilocular, furnished with 2 oblique stigmas. Capsule like a silique, long, nearly cylindrical, without a true septum, 2-valved, which at dehiscence leave the placentae in site. Seeds many, dotted, furnished with an aril shaped like a white ridge. Includes only one species.

CHELIDONIUM MAJUS L. Plant biennial or perennial with an acrid yellowish orange juice. Stem erect, branched, 2-6 dm. high, thickened and easily breaking at the nodes, more or less hairy, or rarely glabrous. Leaves glabrous, or slightly hairy, soft, glaucous especially on the lower surface, pinnatopartite, with 5-11 segments. Flowers yellow in umbels, terminal or opposed to the leaf. Capsule 3-4 cm. long, with a false septum formed by the placentae. (B) or (P) Europe, Asia, North Africa, the Canaries, Madeira; naturalised in North America. April-September. *Malta*, not a true native, but naturalised here and there in gardens, as at San Antonio, Boscehetto, Valletta and Floriana Gardens, Corradino, and occasionally in fields or along roads. Gozo, near Chambray and at Rabato.

The plants met with belong to the typical form with leaves having oval obtuse segments, cut or crenate, the terminal segment being trilobed, and petals entire. E. Cock-foot, Great Celandine, I. Celidonia, Cenerognola, Erba da porri. M. Haxixa tal felul.

#### GLAUCIUM (Tourn.) Hall

Herbs with colourless juice. Sepals u.s. hairy or hispid. Petals u.s. large. Stamens numerous. Ovary bicarpellary, bilocular, with an oblong stigma having 4 spreading lobes. Capsule very long, cylindroid, narrow at the base, 2-valved opening downwards, leaving in site the placentae and the spongy false septum. Seed without aril, reticulate. Includes about 11 species, natives of the Mediterranean region, one of which extending over temperate Europe, Central Asia and North America and another being native of China.

GLAUCIUM FLAVUM Crantz. Plant mostly perennial, intensely glaucous, with bushy ascending branched stems almost glabrous, 2-8 dm. high. Leaves somewhat fleshy, usually papillose and hairy; the radical and lower being petiolate, lyrate pinnatifid with oval or oblong segments, unequally angular and toothed; and the upper being cordate-amplexicaul broadly toothed. Flowers 5-6 cm. in diameter, golden yellow, solitary, terminal, on short thick glabrous peduncles. Capsule 15-25 cm. long, more or less arcuate. (A) or (P) Along the littoral of the Mediterranean region. Western Europe, Central Asia, and the

Atlantic Islands; naturalised in North America. April-July or even later. *Malta*, frequent in many places along the coast. *Gozo* at Dueira, Ramla, Xlendi, Migiarrò. *Comino*, Cala Sta. Maria and "Bejn il Cmiemen".-*Chelidonium Glaucium* L.-*Glaucium luteum* Scop. E. Sea-Poppy, Horned-Poppy. I. Papavero cornuto.

### PAPAVER (Tourn.) L.

Herbs with milky juice and solitary terminal flowers nodding in the buds and furnished with long naked peducles. Sepals 2, free, caducous. Petals 4, convolute and crumpled in the bud. Ovary pluricarpellary, unilocular, but with 4-18 incomplete placental septa: stigma sessile, disk-like with radiating grooves and with as many lobes as there are placentae. Capsule globose, oblong or clavate, dehiscing by means of apical pores opening below and between the lobules of the stigma. Seeds small, reniform, reticulate. Includes about 30 species, natives of Europe, the Mediterranean region as far as India;; one being found in South Africa and tropical Australia.

**PAPAVER HYBRIDUM L.** Plant annual, erect, with erect or applied bristly hairs, with erect or ascending usually branched stem. Leaves bipinnatopartite, the upper pinnatifid, all with linear-lanceolate segments each terminating in a bristle. Sepals more or less bristly. Corolla 2½ to 5 cm. in diameter, usually purplish red or wine-red, with black spot at the base of each petal, sometimes cinnabar red or even white. Stamens dilated at the apex. Stigma 4-6 lobed. Peduncle with applied hairs. Capsule hispid or bristly, very rarely smooth. (A) Europe, the Mediterranean region, the Caucasus, India, the Canaries, naturalised in North America. March-June, sometimes earlier. *Malta* and *Gozo*, frequent in fields and along country roads, but nowhere common.-*Papaver hispidum* Lam. E. Rough Poppy. M. Pepprin.

The form: *ambiguum* Rouy et Fouc., with an oval-oblong capsule much restricted at the base, is also frequent. The form: *siculum* Guss., having the peduncle with stiff erect hairs, and leaves with more acute segments is sometimes met with. *Malta*, l'Istghabar and other places around Curmi.

**PAPAVER RHOEAS L.** Plant annual, with erect stems 3-6 dm. high, with erect hairs. Leaves mostly pinnatoseptate or bipinnatoseptate, oblong-lanceolate, with toothed segments terminating in a hair. Sepals with stiff erect hairs on the outside. Corolla 4-6 cm. in diameter cinnabar red, rarely wine-red or white, often with a black or dark spot at the base of each petal. Stigma with 4-12 lobes. Capsule sub-globose or oval, rarely restricted at the base. (A) Temperate Europe, temperate Asia, North Africa, Canaries, Madeira; naturalised elsewhere. February-May. *Malta*, *Gozo* and *Comino*; very common everywhere, especially in field among growing crops. E. Poppy, Corn Poppy. I. Rosolaccio, Papavero. M. Pepprin.

The form: *Roubiaei* Vig., has a low habit and is very hispid; usually met with in valleys and in exposed situations. The form: *caudatifolium* Timb., has leaves with very large terminal lobe, linear-lanceolate; the form *integrifolium* D. C., has simple, entire, spatulate leaves and is frequent late in the season, in May; the

form: intermedium beck., has deep green very hairy leaves, and petals without the dark spot, also met with frequently in fields.

Var. *pinnatifidum* Moris. Upper leaves pinnatifid, toothed or cut, with oval-triangular segments. Capsule oblong clavate or conical elongated. Upper parts of plant with applied hairs. Anthers yellow. January-April. Very common in fields and along roads in *Malta* and *Gozo*. M. Pepprin.

Var. *dubium* L. Plant u.s. Upper leaves pinnatoseptate or bipinnatoseptate, with linear segments. Anthers violet. Capsule oblong-clavate. March-May. *Malta* and *Gozo*, very common in fields among growing crops. E. Long-headed Poppy.

Var. *obtusifolium* Desf. Plant developed, branched, mostly with applied hairs. Leaves bipinnatopartite or bipinnatifid, with oval-oblong rounded and obtuse segments. Capsule oblong top-shaped. March-May. *Malta* and *Gozo*, very common in fields, especially in open and exposed situations. The form: *angustifolium* Tin. Ex Lojacono.-*Papaver dubium* var. *angustifolium* Sommier, usually with simple stem, one-flowered, with dense erect hairs, the upper leaves pinnatifid with narrow and acute segments is met with frequently especially late in the season.

PAPAVER SOMNIFERUM L. Plant annual, strong, intensely glaucous, with fistulous stem, slightly branched 3-10 dm. high. Leaves oblong, deeply sinuate, toothed and wavy. Cauline leaves amplexicaul. Sepals glabrous or slightly hairy. Corolla large white, pink or violet, mostly dark at the base, with petals corroded along the margin. Stamens with filaments dilated towards the apex. Stigma with 5-18 lobes, deeply divided. Capsule large, stipitate, subglobose or oval. (A) April-July. Mediterranean region, Madeira, Canaries; naturalised or cultivated elsewhere. E. Poppy, Opium Poppy. I. Papavero, Pianta da Oppio. M. Papavru, Xahxieh.

Var. *setigerum* D.C. Leaves often spotted dark along the midrib, cut and toothed, with narrow teeth, finishing in a stiff hair or bristle, more or less hairy. Peduncles and sepals mostly with stiff hairs. Capsule not larger than a walnut, dehiscent. Petals usually light pink sometimes white or violet with a dark spot at the base. *Malta*, *Gozo* and *Comino*, frequent here and there, especially in fields of sulla and other crops. May-June.

Var. *hortense* Hussen.-*Papaver somniferum* var. *glabrum* Boiss. Plant robust u.s.; leaves less divided, usually not spotted or blotched along the midrib, with teeth not finishing in a bristle, usually glabrous. Flowers often double, and often with deeply fringed petals. Capsule subglobose, dehiscent; seed dark or black. *Malta* and *Gozo*, cultivated for ornament, and sometimes met with self-sown or half wild.

## FUMARIACEAE.

Herbs annual or perennial, usually glaucous. Leaves alternate, more or less deeply divided. Flowers zygomorphic, hermaphrodite, sometimes solitary,



usually in axillary or terminal racemes or spikes. Sepals 2, caducous, free, usually petaloid. Petals hypogynous, 4, free or connate at the base, in 2 series, one of the outer being spurred or gibbous, and the two inner being coherent at the tips and enclosing the stamens and stigma. Stamens usually six, rarely four, with connate filaments in two bundles, each with three extrorse anthers of which only the central is 2-celled. Ovary free with a simple style, one-celled, ovules solitary or many. Fruit silique, two-valved, many seeded; or an indehiscent 1-2 seeded nutlet, or a lomentum. Seeds with fleshy albumen, and a small nearly straight embryo.

The family, often considered as a sub-family or tribe of Papaveraceae, includes about 100 species broadly distributed in temperate and warm regions.

The Fumariaceae are tonic and alterative. *Fumaria officinalis* and *F. capreolata* are often used in infusion as stomachic and depurative. The roots of *Corydalis bulbosa* and other species are used as emmenagogues and vermifuges.

### FUMARIA (Tourn.) L.

The two outer petals free and unequal, the upper forming a standard and is spurred at the base, the lower almost spathulate; the two inner adherent at the apex, keeled or winged on the back. A nectariferous process exists at the base of the upper bundle of stamens, and protrudes into the spur. Ovary bicarpellary, unilocular; style filiform caducous, bifid. Fruit a subglobose or compressed nutlet, almost indehiscent. Includes about 7 species and many varieties, natives of the Mediterranean region, Central Europe, South Africa, one being almost cosmopolitan.

**FUMARIA CAPREOLATA L.** Plant annual, often climbing by means of the twisting petioles, glaucous, with stems 2-10 dm. long. Leaves bi-tripinnatoseptate, with obovate or oblong segments, cut or toothed. Flowers large, whitish, yellowish or rosy, usually deep purplish at the apex, 7-15 mm. long. Sepals two, toothed, whitish, bracts similar to the sepals and not longer than the pedicels. Fruit globose or slightly compressed, smooth, not thickened along the margin, indehiscent, without nerves, often with two pits at the apex, on pedicels somewhat recurved. (A) Mediterranean region, Central and Western Europe, Canaries, Madeira; naturalised in South America etc. December-March. *Malta* and *Gozo*, among growing crops and in gardens; the typical form is not frequent.

Var. *flabellata* Gasp. - *Fumaria Martini* Clav. Fruits rugose at least when dry. Sepals shorter and narrower. Flowers whitish, deep purple at the apex. Plant well developed and climbing. *Malta*, *Gozo* and *Comino*; common among growing crops, especially in exposed situations.

Var. *agraria* Lag. Fruit pedicels erect or divergent. Flowers rosy or reddish, intensely coloured at the tip. Sepals about 1/3 the length of the corolla, narrow, lanceolate, acuminate. Fruits large, about 3 mm. in diameter; acuminate. Bracts about as long as the pedicels. *Malta*, *Gozo* and *Comino*, frequent and often common, among crops in early spring.

Var. major badarro. Plant robust, usually ascending or erect, but sometimes climbing. Bracts shorter than the pedicels, sepals oval-lanceolate shortly acuminate, about 1/4 as long as the corolla, hardly keeled, with many teeth. Fruit obtuse, emarginate or rarely apiculate. Flowers in dense racemes. With the preceding especially in exposed situations.

Var. bicolor Sommer. Plant diffuse and much branched. Bract 1 to 3 times shorter than pedicels. Sepals lanceolate, acute, short, narrow, toothed. Corolla white or light violet, deeply coloured at the tip. Fruit apiculate. *Malta*, frequent but not common, at Wied Babu, Ghirghenti, Ta Laurenti, Gnien il Cbir. *Gozo*, at Cala Dueira. Usually found in exposed and wild places, sometimes as at Ghirghenti among growing crops.

Var. serotina guss.-*Fumaria confusa* Jord.-*F. benedicta* Nic.-*F. media* Lois p.p. Plant slender diffuse or climbing. Bracts about 1/2 as long as the pedicels. Sepals as broad as the corolla or more. Flowers 9-11 mm. long in loose racemes. Fruit slightly rugose when dry, broad at the base, about 2-2 1/2 mm. in diam., usually obtuse. Flowers as early as December, and continues in bloom until April. *Malta*, frequent, at Notabile, Wied Encita, St. Paul's Bay, Pualet, Zurriek, Birzebbugia. *Gozo*, rare, at Xlendi.

Var. Guzzoni Boiss. - *Fumaria Jordani* Gus. Plant more robust than in the preceding variety, low and bushy, with smaller leaves having narrower and closer segments. Racemes more dense. *Malta*, rather rare, at Wardia, San Martin, Ghajn Tuffieha, Melleha, Dingli.

**FUMARIA OFFICINALIS L.** Plant annual, glaucous, often climbing, u.s., with branched erect or diffuse stems. Leaves u.s., with linear or filiform segments, and usually intensely glaucous. Flowers small, 3-9 mm. long, rosy white, more intensely coloured at the apex. Sepals narrower than the corolla and not more than one third of its length. Fruit mostly granulose when dry, or rugose; emarginate at the apex. Racemes rather loose, with erect or divergent pedicels, and bracts shorter than the pedicels (A) The Mediterranean region and temperate Asia; naturalised in most countries. December-July *Malta*, *Gozo* and *Comino*, frequent and often common in fields, gardens and especially among growing crops. E. Fumitory. I. Fumosterno, Faccia. M. Dahnet l'art, *Fumaria*. The same names are applied to the preceding species.

Var. floribunda Koch.-var. pycnantha Loret. Racemes dense. Flowers rosy or pink. Plant stronger more bushy, free flowering. *Malta* and *Gozo*, frequent in open fields, from February to May.

Var. tenuiflora Fr.,-*Fumaria Wirtgeni* Koch. Flowers reddish or deep pink, with deeper tip. Plant smaller. Fruit subglobose, obtuse or slightly apiculate. With the preceding, especially on red dry soils, late in the season.

Var. densiflora D.C.-*Fumaria micrantha* Lag. Plant more developed; leaves with grooved segments. Pedicels erect or divergent in the fruit; bracts subequal to the pedicels. Sepals broader than the corolla, and about half as long. Fruit

subglobose, obtuse, but not emarginate. March-May. *Malta*, frequent in many places, Notabile, Birchircara, Marsa, Bahria, Attard, Lia etc.; in fields and gardens, and also on uncultivated ground.

Var. *parviflora* Lam.-*Fumaria leucantha* Viv. Plant u.s. leaves with grooved segments. Pedicels erect or divergent in the fruit: bracts as long as the pedicels. Sepals slightly broader than the pedicel, and only about one-sixth the length of the corolla, which is white or rosy. Fruit subglobose, obtuse, not emarginate. January-May. *Malta*, very common in fields and gardens. *Gozo*, frequent in several places, as at Sannat, Xeuchia, Xlendi, Zebbug, Marsalforno.

Var. *Vaillantii* Lois.- *Fumaria Gasparrini* Bab. Plant more diffuse with larger flowers; leaves with grooved segments, but narrower and filiform. Bracts more than half as long as the pedicels. Sepals narrower than the pedicel, and hardly one-eighth the length of the corolla. Fruit apiculate when young, and afterwards rounded and mucronate. February-June. *Malta*, rather rarely met with; in open fields, as at Attard, Musta and Birchircara.

#### HYPECOUM L.

Sepals 2, free, deciduous. Petals 4, spreading, the outer two obovate and more or less trilobed; the inner two narrower, mostly 3-cleft, with the median segment toothed or ciliated. Stamens 4, free, with bilocular anthers. Ovary unilocular: style bifid with subulate lobes having an apical stigma. Fruit like a siliqua, with many joints, lomentaceous, each joint containing one compressed seed, minutely pitted. Includes about 10 species, natives of the Mediterranean region as far as Central Asia and China.

HYPECOUM PROCUMENS L. Plant annual, more or less glaucous, glabrous, branched at the base, with prostrate ascending stems 1-3 dm. long, grooved and leafless at their lower part. Radical leaves in rosette, petiolate, pinnate, with pinnatifid lobes, which are linear lanceolate or oval-lanceolate and more or less deeply toothed; cauline leaves few, sessile, with smaller segments. Flowers yellow, in corymbose cymes. Petal 3-9 mm. broad. Sepals mucronate. (A) Mediterranean region as far as India. January-April. In fields and on uncultivated ground, especially in the neighbourhood of the sea. *Malta*, frequent in many places, near Addolorata Cemetery, Zabbar, Marsascirocco, Marsascala, Maghtab, Pualet etc. *Gozo*, here and there, at Cala Dueira, Marsalforno, Kbaijar. I. Cornacchina. M. Karn il Moghza.

Var. *glaucescens* Guss. Plants very glaucous: leaves with broader and closer segments. With the species, and often entirely replacing it in more exposed situations.

Var. *grandiflorum* Benth. Leaves with linear segments, broader at the tip. Sepals more mucronate. Petals 10-12 mm. broad. Joints of fruit separating less readily. With the species, especially earlier in the season: near Addolorata Cemetery, Pembroke Camp, Birzebugia etc.

#### CRUCIFERAE.

Herbs, rarely suffrutescent, often with an acrid juice. Leaves alternate, rarely opposite, simple, entire or variously cut, usually without stipules. Flowers hermaphrodite, usually actinomorphic, in terminal racemes or axillary clusters, rarely solitary. Sepals 4, free, in 2 series, the upper two often larger and gibbous at the base. Petals 4, hypogynous, rarely wanting, arranged crosswise in one series, usually entire. Stamens hypogynous, 6, tetradynamous, in 2 series, the outer 2 being short and the inner 4 longer and close together in pairs; sometimes reduced to 4 or 2, rarely more than 6, with subulate filaments and introrse anthers. Ovary of 2 connate carpels, sessile, rarely stipitate, usually 2-celled owing to a false septum. Ovules numerous, sometimes few or solitary. Style simple; stigmas 2, often connate. Fruit a long capsule or siliqua, or a short one or silicule, usually 2-celled owing to the false septum, sometimes indehiscent or even a lomentum, dividing into 2 or more one-seeded joints. Embryo oily, usually curved and exalbuminous.

The family includes 176 genera and about 1200 species broadly distributed all over the world, especially in the Mediterranean region.

The Cruciferae have well-known antiscorbutic properties and several species are cultivated in numberless varieties and forms as vegetables. The seeds of *Brassica nigra*, the Black Mustard, are used roughly powdered as rubefacient and vesicant. The seeds of *Sinapis alba*, the White Mustard, are sometimes mixed with those of *B. nigra* and ground for use as Mustard.

#### TRIBE I-MATTHIOLEAE.

The hypogynous lateral glands solitary or in pairs, but connate; median glands wanting. Fruit long, a siliqua, dehiscing longitudinally into 2 valves. Stigma conical, acute, or cleft into 2 lobes, erect or convergent. Cotyledons flat, with a straight axis.

#### MATTHIOLA R. Br.

Plant mostly whitish with branched or fascicled hairs, rarely glabrous. Stigma accrescent on each side, developing a gibbosity or horn-like process. Siliqua with valves more or less convex and nervus; false septum with longitudinal nerve-like ridges. Seeds in one series, compressed. Includes about 30 species natives of western Asia, one being native of South Africa.

**MATTHIOLA INCANA R. Br.** Plant perennial, sometimes shrubby, with a whitish tomentum, woody at the base, 2-6 dm. high. Leaves oblong, lanceolate or rarely linear-lanceolate, obtuse, entire or sinuate. Petals usually purple, sometimes white or rosy, oval or obovate. Siliqua more or less compressed, on a peduncle much longer than its diameter, with an accrescent usually gibbose stigma. (P) or (S) Western France, South Europe, Cyprus, the Canaries; cultivated and naturalised elsewhere. February-May, *Malta*, frequent on the fortifications of Valletta, Floriana, and the Cottonera, St. Paul's bay near Tower, rocky places at

Misida and St Julians, etc. Gozo, Gran Casteilo, Chambray, San Blas.-  
*Cheiranthus incanus* L. E. Stock, Queen's Stock. I. Violaciocca M. Gizi.

Var. *rupestris* D. C. Plant tomentose- white u.s. Leaves acuminate, entire or slightly toothed.-*Hesperis rupestris* Raf. January-April. Gozo, very rare, on the rocky ground at "Ta Cenc", according to Gulia.

*MATTHIOLA SINUATA* R. Br. Plant biennial or perennial, herbaceous, 2-6 dm. high, tomentose-white, furnished with stipitate glands more or less abundantly on the inflorescence and the fruits. Lower leaves oblong, sinuate or pinnatifid; the upper lanceolate or linear, entire or slightly toothed; all leaves obtuse. Petals white or clear violet, obovate or oblong. Siliqua and pedicel u.s. Stigma accrescent, with 2 gibbosities. (B) or (P) Mediterranean region, Western France, England, April-May. *Malta*, rare, at Wied il Hesri. Gozo, rare, at Dueira and Hagret il General.-*Cheiranthus sinuatus* L E. Great Sea-Stock.

*MATTHIOLA TRICUSPIDATA* R. Br. Plant annual bushy, whitish or ashy green, tomentose, without glands, 1-4 dm. high. Leaves oblong, obtuse, sinuate, pinnatifid, or rarely toothed. Siliqua, subcylindrical, straight or curved, with an accrescent stigma furnished with 3 subulate spreading processes. (A) Mediterranean region, chiefly in sandy places. March-May. *Malta*, Chain Tuffieha, where it is common, Delimara, Calafrana, San Luciano, Marsascirocco, Kajenza.-*Cheiranthus tricuspidatus* L. M. Gizi.

#### MALCOLMIA R. Br

Plants mostly with single or divided hairs, rarely glabrous. Siliqua with valves more or less convex and nerved: false septum with longitudinal nerve-like ridges. Stigma not accrescent, conical acute, or with 2 acuminate lobes, rarely almost capitate. Seeds in one row, compressed. Radicle usually dorsal. Includes 20 species, natives of the Mediterranean region, the Caspian region, Persia, northwest India and North Africa.

*MALCOLMIA MARITIMA* R. Br. Plant annual with scanty applied hairs, ashy green or greenish. Leaves oval-spathulate, or oblong-spathulate, mostly entire. Sepals 5-10 mm. long, the 2 lateral gibbous at the base. Petals rosy or purplish violet. Siliqua subcylindrical, dehiscing with difficulty, furnished with applied hairs. Style and stigma rather long. (A) South Europe; naturalised in Algeria March-May. *Malta*, rare, at Calafrana, near San Luciano, Kajenza, in sandy places. Frequently cultivated in gardens and thence escaping on heaps of rubbish, odd corners etc.- *Cheiranthus maritimus* L. E. Virginia Stock. M. Gazun.

*MALCOLMIA AFRICANA* R. Br. Plant annual, erect, more or less hairy with erect hairs,  $\frac{1}{4}$  dm. high. Leaves lanceolate, acute, sinuate-toothed. Sepals 3-5 mm. long, without distinct gibbosities. Petals obovate or oblong, violet, entire. Siliqua erect almost quadrangular; style and stigma less than 1 mm long. (A) Mediterranean region, Hungary, South Russia as far as India. March-May. *Malta*, rare, on the glaxis of Valleta and Floriana and Blata il bajda.-*Hesperis africana* L.

## TRIBE II - ARABIDEAE.

Lateral hypogynous glands solitary, or in pairs and usually connate: median glands present, rarely wanting. Fruit long, a siliqua, or very rarely shortened (a silicule), dehiscing longitudinally in 2 valves. Stigma capitate, entire or emarginate, or with 2 divergent lobes. Cotyledons flat in transverse section; axis straight, rarely spiral.

### CHEIRANTHUS L.

Plants with fascicled or applied hairs. Median hypogynous glands in pairs. Siliqua with keeled nerved valves. Stigma bilobed. Seeds compressed, in one row. Radicle commissural. Includes about 10 species, natives of the Mediterranean region, Central Europe, the Himalayan region, North America.

CHEIRANTHUS CHEIRI L. Plant perennial, suffruticose, more or less hairy, 1-6 dm. high. Leaves lanceolate, rather fleshy, entire, narrowed into a petiole. Petals mostly yellow veined brown, or rusty or purplish-red. Siliqua compressed, tetragonous, whitish with applied hairs. (P) Native of Western Asia and Kurdistan; naturalised in Central and South Europe and North Africa. Often cultivated for ornament. March-June. *Malta*, rare, Zurrieco, on the bastions of Valletta and Floriana overlooking Marsamuscetto Harbour; often met with self-sown in old gardens. E. Wallflower. Violaciocca gialla. M. Gizi safra.

The form usually met with on the bastions of Valletta is *C. frusticulosus* L., with yellow flowers without brown veins.

### SISYMBRIUM (Tourn) L.

Leaves variously cut, or rarely entire, never cordate at the base, glabrous, or hairy with simple or rarely with branched hairs. Median hypogynous glands solitary. Valves convex or keeled, with longitudinal nerves. False septum with cells not elongated transversely. Seeds in one row, compressed, not striated. Radicle usually dorsal. Includes about 80 species, mostly natives of Europe, North America; a few being found in the southern hemisphere.

SISYMBRIUM IRIO L. Plant annual, vigorous, branched from the base, dark green, 1-8 dm. high, with stems glabrous or slightly hairy. Leaves glabrous or slightly hairy, lyrate-pinnatifid, with triangular toothed lobes. Flowers in long dense racemes; terminal flowers in bloom, becoming rapidly surpassed by the growing siliquae of the flowers just below. Sepals erect. Style almost wanting. Siliquae erect and spreading, very slender, with 3-nerved valves, 3-5 cm. long. (A) Central Europe, the Mediterranean region, as far as Central Asia, Abyssinia, Madeira, the Canaries. February-April. *Malta* and *Gozo*, here and there on uncultivated ground and heaps of rubbish. Frequent in certain places on the glacis of Valletta and Floriana. E. London Rocket.

SISYMBRIUM ALTISSIMUM L. Plant annual, on stiff erect stems, slightly branched, hairy only towards base, dull green, 3-12 dm high. Lower leaves lyrate-pinnatifid, with oval-triangular or lanceolate toothed segments; upper

leaves with linear or filiform segments. Sepals very spreading. Siliquae spreading, 5-10 cm. long, with 3-nerved valves; young siliquae not longer than the flowers immediately above them. (A) Central and Southern Europe. April-June. *Malta*, on the glacis and ditches in Valletta and Floriana; in gardens and along roads near Attard. Appears to be a recent introduction; first detected at Floriana in 1920-Sisymbrium Sinapistrum Crantz.-S. pannonicum Jacq.

SISYMBRIUM SOPHIA L. Plant annual, with abundant short hairs, ashy or ashy green, 1-10 dm. high. Leaves bipinnatifid, with linear or lanceolate segments, entire or toothed. Sepals slightly spreading. Siliqua more or less erect, 15-20 mm. long, with one-nerved valves: peduncles slender. (A) Europe, Asia as far as Japan, North Africa; naturalised in North and South America. March-July. *Malta*, very rare, near Santa Venera at Hamrun according to Gulia, possibly an alien. E. Flix-weed or Flux-weed.

SISYMBRIUM POLYCERATIUM L. An annual erect plant, glabrous or somewhat hairy, fedid, 1-5 dm. high, with long leafy racemes. Lower leaves lyrate-pinnatifid or sinuate pinnatifid, the other toothed or entire, and more or less hastate at the base. Flowers 1-3 in the axil of well developed leaves, on very short thickened peduncles. Sepals erect. Siliquae straight or curved, 10-15 mm. long, with 3-nerved valves. Mediterranean region. March-May. *Malta*, in lanes, along walls of fields, on uncultivated ground, heaps of rubbish, in the central districts of the Island.

SISYMBRIUM OFFICINALE Scop. Plant annual, glabrous or hairy, 2-6 dm. high, with stiff erect stem, and branches at right angles. Leaves pinnatifid, more or less lyrate, with oval or lanceolate segments, entire or toothed. Racemes not leafy. Sepals more or less spreading. Siliquae 12-25 mm. long, applied close to the axis of the raceme, with valves narrowly 3-nerved, and on very short thickened peduncles. (a) Europe, Mediterranean region, Canaries, Azores, Madeira: naturalised in America and Australia. March-July. *Malta* and *Gozo*; common in fields, lanes, along roads, on uncultivated ground and in valleys-Erysimum officinale L. E. bank Cress, Hedge Mustard.

Var. *lejocarpum* D.C. Siliquae glabrous. Frequent with the species at Attard, Wied Encita, Wied is-Suda, and probably elsewhere.

#### NASTURTIUM (L.) R. Br.

Plants glabrous or with few simple hairs. Leaves with or without stipuliform segments at the base. Median hypogynous glands solitary or wanting. Valves convex, with nerve not extending up to the apex. False septum not with cells transversely elongated. Seeds in 2 rows, or rarely in one row, compressed, not striated. Includes about 20 species, very broadly distributed.

NASTURTIUM OFFICINALE R. Br. Plant annual or perennial, with a slender root, with a prostrate or floating stem emitting roots from the lower nodes, rarely entirely erect, 1-7 dm. long. Leaves all pinnatifid, often with cordate segments, mostly roundish or oval, the terminal larger than the others, all entire or toothed. Siliquae as long as, or longer than the peduncles, 8-15 mm. long, with smooth

valves, indistinctly nerved: style almost wanting. Petal white, twice as long as the sepals. (A) or (P) Europe, North and Central Asia; naturalised in North and South Africa, America and elsewhere. January-May. *Malta* and *Gozo*, common in ponds and streams along valleys: often used as salad.-*Sisymbrium Nasturtium aquaticum* L. E. Water-cress. I. Crescione d'acqua. M. Cresciuni or Sija. The form: *siifolium* Rehb, with ovate-oblong or lanceolate segments of leaf, is frequent along with the typical form.

**NATURTUM ARMORACIA** Fr. Plant glabrous, erect, 4-8 dm. high, with a perennial thick deep yellow root, very acrid. Radical leaves with a long petiole, oblong, large, crenate or toothed, sometimes with others pinnatifid; lower cauline pinnatopartite, with lanceolate lobes, the upper lanceolate, undivided. Inflorescence large, paniced. Flowers white; pedicels 4 to 5 times as long as the silicule. Silicule elliptical with a very short style. (P) Native of Central Europe. May-August. Cultivated for its root, and often naturalised in gardens, assuming a perfectly wild habit.-*Cochlearia Armoracia* L.-*Armoracia rusticana* G. M. et S.-A. *sativa* Bernh. E. Horse-radish. I. Cren, Barbaforte M. Horse-radish or Gherk-mustarda.

#### CARDAMINE (Tourn.) L.

Plants glabrous or slightly hairy with simple hairs, and usually not rhizomatose. Median hypogynous glands solitary, rarely wanting. Valves flat, curling up with elasticity. False septum very thin, with cells not elongated transversely. Seeds in one row; radicle along the commissure. Includes about 50 species, natives of temperate and cold regions, especially of Europe and Western and Central Asia.

**CARDAMINE HIRSUTA** L. Plant annual, more or less erect, 3-40 cm. high, with slender root, glabrous or slightly hairy. Radical leaves with segments entire or almost trilobed, the terminal slightly larger; cauline leaves 1-3, less developed, with oblong, oval or linear segments, entire or obtusely toothed. Flowers in simple corymb; peduncles erect, not more than one-half the length of the siliqua. Petals white, entire, longer than the sepals. Stamens sometimes reduced to 4. Siliqua usually closely applied to the axis: style almost wanting. (A) In all countries, except Australia. January-April. *Malta* and *Gozo*, frequent and often common in gardens, shaded valleys, along walls of fields etc. Often eaten as green salad like rocket (*Eruca*). The form: *silvatica* Lk, with more numerous and larger leaves, especially the cauline, and with more robust habit, is frequent with the species. E. Bitter Cress, Lamb's Cress.

**CARDAMINE GRAECA** L. Plant annual, with angular stem, 1-3 dm. high, and leaves all pennatifid, with trifid or pinnatifid lobes, rounded or oval. Petals white, obovate, longer than the sepals. Siliqua glabrous, 3-4 mm. broad, narrowly winged along the margins: style compressed and winged on each side, 1-6 mm. long. (A) South-east Europe, Western Asia. February-April. *Gozo*, in shaded and moist places at Pergla, according to Gulia.-*Pteroneurum graecum* D.C

#### ERUCA (Tourn.) Adams.



Sepals not prolonged at the base. Filaments undivided. Siliqua oblong, dilated at the base, attenuated above, dehiscent in 2 strong valves, prominently one-nerved. Rostrum flattened and membraneous. Seeds in two rows. Includes 4 or 5 species natives of the Mediterranean region.

ERUCA SATIVA Mill. Plant annual, with an erect stem, more or less branched, 2-8 dm. high, hairy or hirsute below, glabrous above. Leaves somewhat fleshy, more or less lyrate-pinnatifid, with lobes toothed or cut or almost entire. Petals pale yellow or almost white, veined purple or violet. Siliqua on a short peduncle, almost tetragonous and conical, erect, glabrous, or rarely hirsute, with a triangular beak, about  $\frac{1}{2}$  as long as the valves. (A) Mediterranean region, Nubia. December-May. *Malta*, *Gozo* and *Comino*; frequently cultivated as green salad, and often met with self-sown in gardens and fields, but is a true native being also found in valleys etc. Wied Babu, Corradino, Notabile, Pergla, Ghain Tuffieha, Marsa, etc.- *Brassica Eruca* L. E. Rocket. I. Rucola, Ruchetta. M. Aruca or Eruca.

Var. *lanceolata* Pomel.-E. *sativa* var. *oblongifolia* Pasquale. Leaves large oblong-ovate, lobulate or simply toothed. Often cultivated in gardens, sometimes met with self-sown.

#### SINAPIS (Tourn.) L.

Sepals not prolonged at the base. Filaments undivided. Fruit a siliqua or silicule, oblong-lanceolate, dehiscing in 2 valves more or less distinctly trinerved. Beak flattened and lanceolate; seeds in one row. Includes 5 species, natives of Central Europe and the Mediterranean region.

SINAPIS ALBA L. Plant annual, erect, robust, covered with stiff hairs, 2-6 dm. high. Leaves pinnatifid or deeply cleft, with a trilobed large terminal segment. Petals clear yellow, without veinings. Siliqua large densely hairy, about twice as long as the peduncle, 2-3 seeded, subcylindrical, spreading or divergent, with trinerved valves, and lanceolate flattened beak. Seeds ashy or reddish. (A) Central Europe, Mediterranean region, Canaries: naturalised in Asia, Africa and America, February-April. *Malta*, rare, Marsa district of Inghieret, Ghain Duieli, Melleha (Gnien Fieres). *Gozo*, also rare, Marsalforno and Ta Cenc, according to Gulia. Frequently cultivated in gardens.-*Brassica alba* Rabenh. E. White Mustard. I. Senape Bianca, Rucchettone. M. Mustarda.

#### BRASSICA (Tourn.) L.

Sepals usually not prolonged at the base. Filaments undivided. Siliqua oblong or linear, dehiscing into 2 valves 1-3 nerved. Beak conical cylindrical, or convex and compressed at the margin. Seeds in one row. Includes about 60 species natives of the Mediterranean region, Central Europe and Central Asia.

BRASSICA ADPRESSA Boiss. Plant annual or biennial, more or less hispid, very rarely almost glabrous, much branched, 3-10 dm. high. Leaves all more or less petiolate, lyrate-pinnatifid, with roundish or oblong lobes, toothed, obtuse or rarely acute; the upper small, lanceolate, almost entire. Petals yellow. Siliqua

glabrous or minutely hairy, cylindrical, restricted below the beak; valves with varying nerves: beak containing seeds oval or oblong, slightly compressed, 3-4 mm. long, rarely sterile and filiform, straight or more or less curved sideways. (A) or (B) Mediterranean region and the Canaries; naturalised in Western Europe and South America. February-may. *Malta*, *Gozo* and *Comino*; common or very common in fields and on uncultivated ground.-*Sinapis incana* L.-*Hirshfeldia adpressa* Moench.-*Brassica incana* Meigen.-*H. incana* I.agreze.-*Erucastrum incanum* Koch. E. Bastard Rocket. M. *Mustarda salvagga*.

**BRASSICA NIGRA** Koch. Plant annual, more or less scabrous and hirsute 5-12 dm. high, much branched. Leaves u.s. Petals yellow Siliqua glabrous, compressed tetragonous not restricted below the beak; valves with prominent median nerve, the laterals less distinct. Beak slender, subulate, about 3 mm. long. (A) Mediterranean region and Central Europe, cultivated or naturalised elsewhere. March-April. *Malta*, rather rare, at Marsa, road to Marsascala, Casal Luca. *Gozo*, also rare, according to Duthie.-*Sinapis nigra* L.-*Brassica sinapioides* Roth. E. Black Mustard I. Senapa, Senapa nera. M. Sinapa, *Mustarda seuda*.

**BRASSICA FRUITCULOSA** Cyr. Plant usually perennial, woody at the base, glaucous, with few hairs, much branched, 2-6 dm. high. Radical leaves pinnatifid, with a large round terminal lobe, and lateral lobes oblong or oval, sometimes limited to one pair; upper leaves slightly cut or entire. Petals pale yellow. Siliqua compressed, more or less torulose; beak without seeds, rarely with one seed, conical elongated, slightly compressed, 2-4 mm. long. (P) sometimes (B) Western Mediterranean region. February-May. *Malta* at Wied Ghomor and Marsa, according to Delicata.

**BRASSICA CAMPESFRIS** L. Plant annual or biennial; stem branched 2-8 dm. high. Radical leaves lyrate-pinnatifid, tubercular and bristly, at least along the margin, deep green; upper leaves almost entire, cordate-amplexicaul. Sepals 3 mm. long; petals yellow, sometimes white; flowers in bloom longer than the upper still in the bud. The shorter pair of stamens with divergent ascending filaments. Siliqua cylindrical, torulose. Beak without seeds, or with 1-2 seeds, cylindrical, 8-10 mm. long (A) or (B) Mediterranean region. November-May. *Malta* and *Gozo*, very common among growing crops. E. Summer Rape, Wild Cabbage, I. Colza, Rapa selvatica. M. Liftia or Caulicelli

The variety: Rapa L., having a large thickened root, conical or globose-depressed, is sometimes cultivated under the name of Swede.

The variety: *Napus* L.-*brassica oleracea* v. *Napo-brassica*-B. o.. var. *esculenta* D.C., with glaucous, glabrous foliage, and flowers in bloom not longer than the upper one in bud, having a thick fleshy root, conical or globose or depressed, is frequently cultivated under the name of Turnip. I. Navone. M. Neveu.

**BRASSICA OLERACEA** L. Plant perennial or biennial, with a thick stem, woody and leafless at the base, branched above, 2-10 dm. high. Leaves large, lyrate-pinnatopartite, fleshy, glaucous, the lower with very large terminal lobe; lateral lobes oval or oblong, toothed or sinuate. Sepals 6-10 mm. long. Petals yellow or white. Filaments all erect. Siliqua 12-80 mm. long, with a seed-bearing beak,

dilated at the base, rarely sterile and cylindrical, 4-12 mm. long. (B) or (P) Western and Southern Europe, naturalised elsewhere: cultivated in many varieties and forms. March-June. *Malta* and *Gozo*, the original wild plant is only met with as an escape from cultivation.

The following varieties are cultivated:

Var. *Botrytis* L. E. Cauliflower. I. Cavolfiore, broccoli. M. Pastard, Fiuri, Broccoli. Stem simple, flowers mostly abortive on thickened fleshy peduncles, forming a dense globular head.

Var. *gongyloides* L. Stem thickened and globose. E. Kohl-rabi. I. Cavolo-rapa. M. Gidra.

Var. *capitata* L. Tender leaves flat, densely folded, forming a thick head, flat or globose or conical. E. Cabbage. I. Cavolo-cappuccio. M. Caboccia.

Var. *sabauda* L. Tender leaves bullate, densely folded forming a head u.s. E. Savoy-cabbage. I. Verza, Cavolo-cappuccio cresco. M. Cabocci Savoja or Cabocci tal bziezak.

Var. *gemmifera* D. C. Stem with many small cabbage-like buds. E. Brussels-sprouts. I. Cavolo di Bruxelles. M. Cabocci taz-zocc, Cabocci ta Brussels.

BRASSICA TOURNEFORTH Gowan. Plant annual or biennial, deep green, hispid; with a simple or branched stem, 2-6 dm. high. Leaves membraneous, the radical forming a rosette, lyrate-pinnatopartite; the upper much smaller and often entire and linear. Sepals 3-4 mm. long. Petals pale yellow. Siliqua cylindrical, torulose; beak sterile or with 1-2 seeds, lanceolate 6-12 mm. long. (A) or (B) Mediterranean region. Caspian region, Persia as far as India. March-April. *Gozo*, rare, near Rabato along the way to Wied il Lunziata.-*Brassica sabularia* Moris.

#### DILOTAXIS D.C.

Sepals not prolonged at the base. Filaments undivided. Siliqua linear, dehiscing in two one-nerved valves; beak subcylindrical or wanting. Seeds mostly in two rows. Includes about 20 species, natives of Central Europe and the Mediterranean region.

DILOTAXIS ERUCOIDES (L) D. C. Plant annual, with a leafy stem, more or less glabrous, 2-5 dm. high. Radical and lower cauline leaves lyrate-pinnatopartite or lyrate-pinnatifid, with oblong or oval toothed lobes; the upper cauline, cut or toothed and oblong, often entire. Peduncles not more than 1/3 the length of the siliqua. Sepals spreading, shorter than the peduncles; petals white or flesh-pink, veined violet, twice or thrice as long as the sepal. Siliqua ascending, restricted towards the apex, with a beak having 1-2 seeds, or often seedless. (A) or (B) Mediterranean region, Central Europe, Abyssinia. November-June. *Malta*, *Gozo* and *Comino*; very common everywhere, often

forming extensive white carpets in fields from November to March or later-  
*Sinapis erucoides* L.-*Brassica erucoides* Boiss. M. Gargir.

Var. *apula* Ten.-*Sinapis apula* Ten. Flowers mostly flesh-coloured, with a purplish claw. Siliqua much longer than in the type. Leaves sinuate-toothed, with triangular lobes, the terminal obovate-obtuse. With the species, especially in dry and exposed localities.

**DILOTAXIS VIMINEA D.C.** Plant annual, glabrous glaucous green, 1-3 dm. high. Leaves somewhat fleshy, sinuate-toothed, pinnatifid or pinnatopartite, often more or less lyrate. Lower peduncles as long as the sepals: sepals erect. Petals yellow, oblong, as long as the sepals or longer. Flower-stems more or less prostrate. Siliqua stipitate, more or less erect, with a short style. (A) Mediterranean region and Central Europe. October-June. *Malta* and *Gozo*, frequent and often common on uncultivated ground, along roads and in fields. The form: *integrifolia* Guss., with leaves sinuate or simply crenate-toothed is frequent along roads and arid localities; the form: *hiemalis* Sommier, is a biennial or sub-perennial, flowering soon after the first rains in October; it is frequent on the glais of Valletta and Floriana, along roads and in moist valleys.-*Sisymbrium vimineum* L.-*Brassica viminea* Boiss. The plant is eaten as salad instead of rocket.

**DILOTAXIS MURALIS (L) D. C.** Plant annual, biennial or perennial, with a strong acid flavour of rocket, glabrous or slightly hairy, glaucous green, 1-6 dm. high, more or less branched. Leaves somewhat fleshy, u.s.; cauline leaves few, sessile or amplexicaul, subentire or slightly toothed. Sepals erect; petals yellow. Peduncles shorter than the siliqua, the rest u.s. (A), (B) or (P) Mediterranean region, Europe, naturalised in South America. January-May. *Malta*, frequent but not common, on the Valletta and Floriana glais, near Blata il Bajda etc. *Sisymbrium murale* L.-*Brassica muralis* Huds. E. Stink-weed.

Var. *tenuifolia* D.C. - *Sisymbrium tenuifolium* L.-*brassica tenuifolia* Fr. Plant perennial, generally woody at the base, branched, with many cauline leaves, and generally without radical leaves. Sepals divergent. *Malta*, frequent and often very common, near Addolorata Cemetery, glais of Valletta and Floriana, Marsa, Casal Luca, Krendi, Zabbar, Siggiewi, Dueira lines etc. *Gozo*, rather rare, at "Ta Cence", Imgiar ix-Xini, near Fort Chambray, Migiarro, Nadur and Kala. The foliage is eaten instead of rocket. E. Wall-Rocket.

#### MORICANDIA D. C.

The two outer petals prolonged at the base or gibbous. Filaments undivided. Siliqua linear, dehiscent in 2 one-nerved valves: beak conical subulate. Seeds in two rows. Includes 10 species, natives of the Mediterranean region and Arabia.

**MORICANDIA ARVENSIS (L). D.C.** Plant biennial or perennial, glabrous, glaucous, suffruticose, 2-6 dm. high. Leaves fleshy, oval or oblong, entire or crenate, restricted into a petiole; lower leaves often disappearing in the flowering period. Cauline leaves sessile, cordate-amplexicaul. Sepals erect, the outer two gibbous. Petals rosy or white, rather large. Siliqua almost tetragonous,,

cylindrical, with 2 one-nerved valves. (B) or (P) Mediterranean region and the Sahara. March-September. Gozo, according to Gulia, not found again by others.-*Brassica arvensis* L.

#### CONRINGIA HEIST.

The two outer sepals gibbous at the base. Filaments undivided. Siliqua linear, dehiscent in 2 one-nerved valves, with a subulate style. Seeds in 2 rows; cotyledons not keeled, but concave. Includes 6 species natives chiefly of the eastern Mediterranean region.

CONFRINGIA ORIENTALIS (L). Andrzej. Plant annual, glabrous, glaucous or glaucous-green, 2-6 dm. high, with erect leafy stems. Leaves entire, oval or oblong-elliptical, sessile, the lower narrowed at the base, the cauline cordate-amplexicaul. Sepals erect, petals pale yellow or yellow. Siliqua tetragonous, with one-nerved valves, with a short style. (A) Mediterranean region and Central Europe. June-September. *Malta*, rather rare, in and near the Addolorata Cemetery.-*Brassica orientalis* L.-*Erysimum orientale* Mill.-*E. perfoliatum* Crantz.-*Conringia perfoliata* Lk.

#### TRIBE IV-RAPHANEAE.

Lateral hypogynous glands solitary or in pairs but connate; the median glands present. Fruit long (siliqua) or short (silicula), indehiscent or only partly dehiscent, dividing transversely into joints. Cotyledons concave-convex; radicle dorsal.

#### RAPHANUS (Tourn.) L.

Sepals erect, the outer two gibbous at the base. Petals with a long claw. Filaments undivided. Fruit short and continuous, or elongated and jointed, with 2 or more subequal one-seeded joints: beak subulate. Includes only one species native of Europe, the Mediterranean region; naturalised elsewhere.

RAPHANUS RAPHANISTRUM L. Plant more or less hirsute, much branched, 2-10 dm. high. Root slender. Lower leaves lyrate pinnatoseptate, with a large round or oval terminal segment, all lobes toothed: upper leaves oval or lanceolate, toothed. Outer sepals gibbous at the base. Petals white or mauve or pink, very rarely yellow, with or without violet veins. Fruit thick ovoid or oblong-cylindrical, of horny consistence, deeply striated, 3-4 mm. in diameter, jointed, with one seed in each joint, glabrous or very rarely hispid (A), (B) or (P) Mediterranean region, Europe; naturalised elsewhere. December-May. *Malta*, *Gozo* and *Comino*, common on cultivated and uncultivated ground, in fields of sulla etc. e. White Charlock, Wild Radish I. Rapastrello, Ramolaccio selvatico. M. Ravanell salvagg.

Var. *Landra* Moretti. Leaves with distant lobes. Petals yellow or white.-*Raphanistrum Landra* Lk. March-June. *Malta* and *Gozo*, in fields and valleys here and there, but nowhere frequent.

Var. *maritimus* Sm. Root much thickened. Leaves with lobes closely set. Petals yellow, rarely white much longer than in the typical form.-*Raphanistrum maritimus* Hornem. *Malta*, rare, in sea-side localities, at Ghain Tuffieha, Gneina, Bahria and Mejesa.

Var. *sativus* L.-*Raphanus Radicula* Pers. Root much thickened, fleshy and watery, red or white, round, oblong or fusiform. Cultivated, sometimes self-sown in fields of sulla. E. Radish. I. Radice or Rafano M. Figel (the fusiform root), ravanell (the round and oblong).

Var. *niger* Mill. Root thickened and fleshy, but less watery, black or blackish externally. Cultivated. E. Summer Radish. I. Ramolaccio. M. Figel tas-saif.

#### RAPISTRUM Crantz.

Sepals diverging, the outer two gibbous at the base. Petals with a long claw. Filaments undivided. Fruit divided into two unequal joints; beak subulate or rudimental. Includes about 10 species natives of the Mediterranean region and Central Europe.

RAPISTRUM RUGOSUM (L.) All. Plant annual, sometimes biennial or subperennial, hairy, much branched, with divergent branches, 2-6 dm. high. Lower leaves lyrate-pinnatoseptate or undivided, more or less oblong; the upper toothed or sinuate, oblong or lanceolate. Petals pale yellow; pedicels thickened in the fruit as long as the lower joint, which is thicker than the pedicel itself and ovoid or obconical, the upper joint being globose, grooved, with tubercles and ridges. (A) Mediterranean region and central Europe. February-June. *Malta*, frequent in many places and sometimes common, as at Ghain Tuffieha, Bahria, St. Julians, Maghtab, Birzebbugia, Kajenza, Krendi, Siggiewi etc. *Gozo*, less frequent at Ta Cenc, Xaghra, nadur, Xlendi, Wied iz-Zejt etc. *Comino*, on rocky ground near kala Sta. Maria- *Myagrum rugosum* L.-*Cakile rugosa* L'herit-Schrankia rugosa Medic The plant with glabrous fruit (form: *glabrum* Host.-*Myagrum venosum* Pers.), is less frequent than the form with hairy and scabrous fruit (form: *scabrum* Host.-*Myagrum procumbens* Pourr).

#### CAKILE (Tourn.) L.

Fruit with two joints; the upper tetragonous or compressed, beaked, one-seeded, dropping off at maturity; the lower cylindrical below, and dilated above into two horn-like processes, one-seeded, rarely seedless, persistent. Cotyledons straight; radicle on the commissure. Includes four species natives of Europe, the Mediterranean region, North and Central America and Australia.

CAKILE MARTIMA Scop. Plant annual, glabrous, fleshy, with prostrate ascending stems 1-4 dm. long. Leaves oblong, deeply lobed, pinnatopartite, or pinnatifid. Petals rosy or violet. Upper joint of fruit tetragonous or compressed, beaked, one-seeded, dropping off at maturity. (A) Europe, Mediterranean region, Madeira, Australia. March-August. In sandy sea-side places, often just out of the reach of the waves. *Malta*, frequent at Melleha, St Paul's Bay, Bahar ic-Ciaghak, Saline, Gneina, ghain Tuffieha etc. *Gozo*, Ramla, Xlendi, Marsalforno, Kbajjar. *Comino*, Kala Sta. Maria. - *Bunias Cakile* L. the form: *aegyptiaca* W.-

*Cakile latifolia* Poir.- *Cakile maritima* var. *latifolia* Desf.- *Isatis aegyptia* L, with leaves simply cut, toothed, crenate or almost entire, is met with at Melleha, Maghtab, etc. (Malta), and at Ramla and Kbaijar (Gozo). E. Common Sea-Rocket. I. Baccherone, Ravastrello. M. Cromb il bahar.

#### ENARTHROCARPUS Labill.

Fruits mostly recurved, hairy or glabrous, consisting of two joints, the lower joint with narrow margin one to two-seeded, the upper winged along the margin, and slightly torulose, with three or more seeds, finishing in a flattened beak. Includes 5 species, natives of the eastern Mediterranean region.

ENARTHIROCARPUS PTEROCARPUS D.C. Plant annual, branched, diffuse or ascending, hairy-hispid, 1-5 dm. high. Lower and middle leaves lyrate-pinnatopartite, with 3-5 lobes on each side, all toothed; upper leaves lanceolate or linear, toothed or entire. Raceme long, with pedicels 3-6 mm. long. Petals obovate, much longer than the sepals, yellow or yellowish white, veined purple. Fruits recurved, compressed, with short bristles; upper joint striated longitudinally, with 10 or more transverse grooves, with as many seeds. Beak 7-13 mm. long. (A) Native of North Africa from Libia to Nubia. March-May. Naturalised in Malta since 1877, but still limited to the marsamuscetto side of Valletta and Floriana as far as Portes des Bombes.-*Raphanus pterocarpus* Pers.

#### BENIAS L.

Fruit not jointed, tetragonous with angles mostly narrowly winged, with 1-2 cells in the upper portion and 1-2 cells in the lower part, all cells one-seeded. Cotyledons spiral; radicle dorsal. Includes 5 species natives of the Mediterranean region as far as Central Asia.

BUNIAS ERUCAGO L. Plant annual, with short simple or branched hairs, and dark sessile glands, 3-6 dm. high. Lower leaves mostly pinnatopartite with triangular lobes, rarely sinuate-toothed; upper leaves lanceolate, toothed or entire. Petal yellow. Fruit with 4 wings, more or less developed, sometimes wingless. (A) Mediterranean region. February-April. *Malta*, very rare, Cottonera at St. Clement's ditch, according to Gulia. *Gozo*, also very rare, Wied il Lunziata, according to Duthie-Myagrurn *Erucago* Lam-*Erucago campestris* Desv.

#### TRIBE V-ALYSSEAE.

Lateral hypogynous glands in pairs and free; the median solitary. Sepals not gibbous at the base. Fruit short, a silicule, with compressed margins, and usually entirely compressed; false septum usually extending throughout the breadth of the silicule, rarely wanting.

#### ALYSSUM L.

Fruit dehiscent, usually compressed, 2-celled, each cell one-seeded. Radicle on the commissure. Includes about 100 species, natives of Europe, the Mediterranean region as far as Central Asia, Canaries, Madeira; naturalised elsewhere.

ALYSSUM MARITIMUM (L.) Lam. Plant perennial, green or whitish green, with applied double hairs. Stems 1-3 dm. long, woody at the base, diffuse or prostrate. Leaves linear or lanceolate, entire, at first silvery and then greenish. Silicles in a long raceme, hairy, round-elliptical, compressed, about 2mm. broad, with 2 cells, each having one seed narrowly winged on one side. (P) South Europe, North Africa, Canaries; naturalised in Mexico. October-June. *Malta*, *Gozo* and *Comino*, *Filfol*, very common on rocky ground, walls, uncultivated land and along roads; in flower practically all the year.-*Clypeola maritima* L.-*Lobularia maritima* Desv.-*Koniga maritima* R. Br. E. Allison, Sweet Alysson, M. Buttuniera.

#### TRIBE V-DRABEAE.

Lateral hypogynous glands in pairs and free: the median solitary. Sepals not gibbous. Fruit a silicle, convex along the margin, for the rest convex or flat. False septum about as broad as the silicle, rarely wanting.

#### DRABA L.

Fruit dehiscent, compressed, with 2 many-seeded cells. Seeds with free funicle; radicle on the commissure. Includes about 150 species, natives of cold and temperate mountainous regions.

DRABA VERNA L. Plant annual, sparsely hairy, with bifid or trifid hairs. Stem slender and leafless, 3-15 cm. high. Leaves radical forming a rosette, oval or oval-lanceolate or even linear, entire or toothed. Flowers minute, white; petals longer than the stamens. (A) Europe, the Mediterranean region as far as India, North America. December-March. *Malta*, rather rare, Casal Luca, Nghieret, near Addolorata Cemetery, Wied Babu, Hagiar Kim, Wied Dalam. *Gozo*, according to Gulia.-*Erophila vulgaris* D.C.-*E. verna* E. Mey. E. Common nail-wort.

#### NESLEA Desv.

Fruit indehiscent, subglobose, at first 2-celled, and afterwards one-celled and one-seeded. Style surrounded at the base by a prolongation of the apex of the fruit. Cotyledons flat; radicle dorsal. Includes only one species.

NESLEA PANICULATA (L.) Desv. Plant annual, greyish green, covered with branched hairs. Stem erect, branched above, 3-6 dm. high. Radical leaves oblong; the cauline sessile, sagittate-amplexicaul, lanceolate; all entire or toothed. Flowers in a long raceme, yellow. Fruit globose, coriaceous, indehiscent, reticulate, rugose, mucronate. (A) Europe, the Mediterranean region as far as India and Siberia; naturalised in North America. February-May. *Malta*, frequent here and there from Zurrigo to Mafa, but nowhere common. *Gozo*, at Pergla, Migiarro, Xeuchia and Sannat-Myagrums *paniculatum*-L-*Vogelia sagittata* medic.-*V. paniculata* Hornem.

#### TRIBE VII-THLASPEAE L.



Lateral hypogynous glands in pairs and free: the median solitary. Fruit a silicule, usually with valves keeled or winged along their median line. False septum much narrower than the transverse diameter of the fruit.

#### CORONOPUS (Rupp.) Gaertn.

Filaments all entire. Fruit with one-seeded cells, with valves separating from the septum and enveloping the seed. Radicle dorsal. Includes about 10 species, mostly natives of subtropical regions, a few being natives of Europe and the Mediterranean region.

CORONOPUS DIDYMUS (L.) Sm Plant annual, with prostrate hairy stems, 1-3 dm. long. Leaves pinnato-partite, with numerous lanceolate or linear segments, entire or toothed. Racemes sessile, opposed to and longer than the leaves. Petals white, shorter than the sepals, or wanting. Silicules emarginate at the apex and cordate at the base, shorter than the pedicels, with a very short style, reticulate-rugose (A) Native of North and South America; naturalised in Europe, North and South Africa, Java, Australia etc. March-May. *Malta*, frequent on the Valletta and Floriana glacis, Gzira, San Antonio Gardens, Blata il bajda, Nghieret (Marsa) etc. *Gozo*, rare, at Rabato, -*Lepidium didymus* L.-*Senebiera didyma* Pers. -*S pinnatifida* D.C. E. Wart Cress or Swine's Cress.

CORONOPUS PROCUMBENS Gilib. Plant annual, glabrous, with prostrate stems all round, or almost stemless. Leaves u.s. but larger and of a deep green. Racemes u.s. usually shorter than the leaves. Petals white, longer than the sepals. Silicules cordate at the base, apiculate, terminating in a short pyramidal style, equal to the pedicels or longer, reticulate and ridged, with protruding tubercles along the margin. (A) Europe, the Mediterranean region, South Africa and South America. March-June. *Malta*, not common, at Wied Encita, Wied il Kleigha, Wied gherzuma, Marsa, Casal Luca, Musta, Wied il Ghasel, Saline, Floriana Glacis etc. *Gozo*, more frequent, Wied Marsalforno, Xlendi, Imgiar ix-Xini, Xaghra, Nadur etc.-*Cochlearia Coronopus* L.-*Lepidium squamatum* Forsk.-*Coronopus Buelli* All-C. *depressus* Moench.- *C. vulgaris* Desf.-*Senebiera Coronopus* Poir. E. Wart Cress or Swine's Cress.

#### LEPIDIUM L.

Filaments entire. Fruit with one-seeded cells; valves not enveloping the seed after dehiscence; fruit very rarely indehiscent. Radicle dorsal, rarely almost lateral. Includes about 100 species, distributed all over the world, except in very cold regions.

LEPIDIUM DRABA L. Plant perennial, with creeping rhizome and erect stems, 3-6 dm. high. Leaves pubescent and whitish, very rarely almost glabrous, toothed, rarely entire; the radical petiolate oblong; the cauline sessile, oblong-lanceolate, cordate-amplexicaul. Racemes in dense panicle, more or less corymb-like. Petals white. Fruit indehiscent, cordate at the base, more broad than long, reticulate-rugose, rounded at the margin, with one-seeded cells. (P) Central Europe, the Mediterranean region and Asia as far as India and Siberia;

naturalised in South America. April-May. *Malta*, not frequent. Road to Paola near Addolorata Cemetary, Wied Casal Lia and Balzan, along road Curmi-Zebbug, Marsa, Floriana Glacis, near San Antonio Gardens etc. *Gozo*, along road to Marsalforno near Rabato.-Cochlearia Draba L.-Cardaria Draba L. E. Hoary Cress. I. Lattone, Cocola.

LEPIDIUM GRAMINIFOLIUM L. Plant perennial, rhizomatose, glabrous or slightly hairy, erect, 2-6 dm. high. Radical and cauline leaves petiolate, oblong, toothed, cut or lyrate-pinnatoseptate with oval serrated segments: upper cauline leaves sessile, linear, entire or slightly toothed, restricted at the base. Stamens sometimes reduced to two. Flowers white in long erect racemes forming a broad panicle. Fruit oval-acute, not emarginate, slightly swollen. (P) Central Europe, the Mediterranean region as far as Central Asia and Siberia. April-September, sometimes as early as December. *Malta*, in many places on the Marsamuscetto side of Valletta and Floriana, Marsa, blata il Bajda, Cottonera. *Lepidium Iberis* L. p.p.-L intermixtum Ten.

LEPIDIUM SATIVUM L. Plant annual, glabrous or very slightly hairy, with a strong flavour of rocket. Radical and lower leaves pinnatopartite with oval or linear segments, entire or cut. Cauline leaves pinnatifid or slightly cut. Stem erect, usually branched above in a loose panicle, often simple. Flowers white, rather large. Stamens 2 to 6. Fruit oval, broadly winged at the apex, which is emarginate. (A) Native of Eastern North Africa, and Southern Western Asia: cultivated and naturalised in most countries. February-May. *Mala*, cultivated as salad, and often naturalised in old gardens. E. Garden cress. I. Agretto, Crescione inglese. M. habberxa.

#### HUTCHINSIA R. Br.

Filaments entire. Silicule with 2 or more seeds in each cell, oval or roundish, not cuneate at the base. Seeds with free funicle. Radicle dorsal or almost on the commissure. Includes 8 species, natives of the northern hemisphere, one being found also in South America and Australia.

HUTCHINSIA PROCUMBENS Desv. Plant annual, usually glabrous or with few minute simple hairs; stems leafy, usually prostrate, 3-20 cm. long. Radical leaves petiolate, oval or linear, undivided or pinnatopartite with 3 to 9 lobes; cauline leaves sessile, similar to the radical. Petals white. Fruit a silicule globose or elongated, with 6 to 12 seeds in each cell. (A) Central Europe, the Mediterranean region as far as India, North and South America, Australia, Canaries. March-April- *lepidium procumbens* L.-*Hymenolobus procumbens* Nutt-*Capsella procumbens* Fr. - *Noccaea procumbens* Rehb..

Var. *Sommieri* Pam. Plant small, with leaves entire or slightly lobed. Fruit rather large, globose or elliptical. Petal broad, about as long as the sepals which are 1 mm. long. Stems and pedicels densely covered with short hairs. *Gozo*, rare, in arid localities, at Ta Harrax, according to Gulia. *Comino*, also rare, in similar localities.

#### CAPSELLA Medic.

Filaments entire. Silicule with many-seeded cells, cuneate at the base, triangular. Seeds with free funicle. Radicle dorsal. Includes only one species which is cosmopolitan.

**CAPSELLA BURSA-PASTORIS L.** Plant annual, more or less hairy, with an erect stem, simple or branched, 3-30 cm. high. Radical leaves forming a rosette, petiolate, entire or variously cut or pinnatopartite; cauline leaves sagittate-amplexicaul, oblong or lanceolate, serated. Raceme simple, long. Sepals with a narrow white margin, often purplish externally. Petals white, as long as the sepals or slightly longer, sometimes partly staminiferous. Fruit compressed, triangular, lunate at the base, and bilobed at the apex. (A) December-may. *Malta*, *Gozo*, *Comino* and *Cominotto*; very common everywhere. E. Shepherd's purse. I. Borsa di pastore, Borsacchina. M. Gargir il gemel.

Var. *rubella* Rent. Sepals purple, petals purplish white hardly longer than the sepals; style very short; sides of fruit not straight but cocave. Seeds smaller-*Capsella rubescens* Personnat. Frequent with the type, in exposed and arid localities.

#### TEESDALEA R. Br.

Filaments free, with a scale-like tooth at the base. Silicule with two 2-seeded cells. Radicle on the commissure. Includes only one species.

**TEESDALEA NUDICAULIS (L). R. Br.** Plan glabrous or slightly hairy, annual, with erect fertile naked stems and ascending sterile stems, having 1 to 2 leaves, 3-15 cm. high. Radical leaves forming a rosette, petiolate, pinnatopartite, or lyrate, or entire. Petals white, two of them being longer than the others. Fruit flattened, almost round, narrowly winged, emarginate at the apex. (A) Europe, the Mediterranean region, Madeira. February-may-Guepinia nudicaulis bast-Reesdalea Iberis D.C.

Var. *regularis* Sm.-*Lepidium nudicaule* L.-Guepinia *Lepidium* D.C.-*Thlapsi coronopifolium* Berger-Teesdalea *Lepidium* D.C.-*T. coronopifolia* Thell Plant u.s. Petals all equal. *Malta*, very rare, at Wardia. *Gozo*, very rare at Ta Cenc.

#### THLASPI L.

Filaments undivided. Silicules with 2-seeded cells, with acutely keeled margin or more often prolonged into a wing narrow below and broad above, and more or less deeply emarginate. Radicle on the commissure. Petals equal or almost equal. Includes about 60 species, natives of Europe, the Mediterranean region as far as Central Asia and Siberia, South America.

**THLASPI PERFOLIATUM L.** Plant annual, glabrous, prostrate or erect, 1-4 dm. high. Radical leaves petiolate, oval; the cauline sessile sagittate-amplexicaul, oval or lanceolate, entire or toothed. Raceme long and loose. Petals white. Silicule obovate, elongated, more or less broadly emarginate, with two membranous wings at the apex, having the margin distinctly thickened. Cells with 4 to 8 seeds. (A) Europe, the mediterranean region, Siberia. February-May.

*Malta*, rare, St Andrews and Pembroke Camp, Maghtab, Wied Kirda, Wied ghomor, Wied il Baruni, Gneina, Imgjar. *Gozo*, rare, at Wied il Lunziata and Pergla.

IBERIS UMBELLATA L- *Thlaspi umbellata* Crantz., is commonly cultivated for ornament and is frequently met with self-sown.

#### BISCUTELLA L.

Filaments undivided. Silicule with one-seeded cells. Valves very compressed, circular, enveloping the seed after dehiscence; fruit therefore shaped like an oo. Radicle on the commissure. Includes about 12 species, natives of Central and Southern Europe, and the Canaries.

BISCUTELLA DIDYMA L. Plant annual, more or less hirsute below, but glabrous above, with an erect stem simple or branched above, 1 to 6 dm. high, and with a straight and deep tap-root. Radical leaves obovate or oblong or oblanceolate in shape; the cauline often reduced and bract-like. Flowers yellow. Fruit with flat valves almost circular, 3-6 mm. in diameter, emarginate at the base and at the apex. (A) Mediterranean region and Persia. E. Buckler Mustard. M. Xeht il forom.

Var. *apula* L.-*Biscutella ciliata* D.C. Radical leaves simply toothed, lanceolate or ovate-acute. Stem more or less branched and leafy. Fruit 6-10 mm. in diameter, ciliated and glandular along the margin, smooth, scabrous or hairy on the disk. *Malta*, *Gozo* and *Comino*, frequent and often common in fields, valleys and on uncultivated land.

Var. *lyrata* L.-*Biscutella marginata* Ten. Radical leaves lyrate, pinnatifid or pinnatopartite, very hirsute. Fruit ciliated and glandular along the margin, and usually hairy and glandular on the disk. With the preceding, and often replacing it in valleys and on good soil.

Var. *raphanifolia* Poir.-*Biscutella laxiflora* Presl. Leaves u.s. Fruit smooth and glabrous. With the preceding in fields, valleys and gardens.

#### CAPPARIDACEAE.

Herbs often shrubby or frutescent. Leaves alternate, rarely opposite, petiolate, simple or digitate with entire leaflets, rarely toothed. Stipules often wanting, sometimes minute or setaceous or spinescent. Flowers actinomorphic, sometimes zygomorphic, hermaphrodite, rarely dioecious, axillary in cymes or solitary, or in a terminal raceme or corymb. Sepals 4-8, mostly unequal, free or connate in a tubular calyx. Petals usually 4, rarely reduced to 2 or wanting, sessile or clawed. Stamens usually 6, rarely 4, often in multiples of 6 or 4, on long filiform filaments, free or united at the base, with 2-celled introrse anthers. Ovary usually stipitate and one-celled, with a short style or with a sessile capitate stigma. Ovules numerous, rarely solitary. Fruit a capsule, 2-valved like a silique or a berry. Seeds reniform or angular, exalbuminous or rarely albuminous, with a curved embryo.

The family includes 34 genera with about 380 species, natives of the warmer regions of both hemispheres.

The flower-buds or capers of *Capparis spinosa* and its var. *rupestris* are in common use pickled with salt and vinegar. Other species of *Capparis* are similarly used in the East. The leaves of *Capparis spinosa* are bruised and used as poultices for gouty affections.

### CAPPARIS L.

Calyx of 4 sepals, imbricate, the upper more hooded than the others. Corolla of 4 petals, contorted in the bud; the lower 2 with a hairy appendix at the base. Stamens numerous, a multiple of 4, with long filaments. Ovary on a long gynophore, with a sessile stigma. Berry dry, with a cartilaginous epicarp and pulpy placentae. Seeds many, reniform, blackish. Includes about 150 species, natives of tropical and warm regions, except North America.

**CAPPARIS SPINOSA L.** Plant perennial woody at the base. Stems bushy, cylindrical, simple or branched, 4-15 dm. long. Leaves shortly petiolate, fleshy, roundish or oval, entire, glabrous, green or glaucous. Flowers solitary, axillary, on very long pedicels. Sepals ovate or oblong. Petals large, obovate, white. Filaments of stamens usually reddish. Berry becoming reddish at maturity, dehiscent anteriorly. (P) or (S) Mediterranean region. April-September. E. Caper-plant. I. Cappero or Capparo. M. Cappara.

Var. *inermis* Turra. Plant glabrous: leaves roundish or oval, not mucronate or indistinctly mucronate. Stipulary thorns straight, herbaceous, deciduous.- *Capparis rupestris* S. et S. *Malta, Gozo and Comino*; common on old fortifications, rocky ground, rocky valleys and precipitous cliffs, especially close to the sea-coast.

## ORD. CISTIFLORAE.

### CISTACEAE.

Herbs, frutescent plants or shrubs, usually pubescent or tomentose. Leaves simple, entire, opposed, rarely alternate or whorled, with foliaceous stipules or with implexicaul petiole. Flowers actinomorphic, hermaphrodite, terminal, solitary or in cymes. Calyx of 3 sepals, contorted in aestivation, often furnished with 2 lower bractiform sepals. Petals hypogynous, usually 5, rarely 3 or wanting, fugacious, contorted in aestivation. Stamens indefinite, hypogynous, with free filiform filaments and 2-celled introrse anthers. Ovary free, sessile, one-celled or imperfectly septate, with 2 or more cycles, and with a simple style, terminating in 3-5 stigmas, more or less connate. Fruit a capsule. Embryo usually curved or coiled, with a floury or horny albumen.

The family includes 4 genera with about 80 species, mostly natives of the Mediterranean region.

The ladanum of Crete, a strongly scented resinous substance formerly much used in perfumery, was obtained from the glands of the flowering tops of *Cistus creticus*.

#### HELIANTHEMUM (Tourn.) Adams

Calyx of 3 sepals, and usually with 2 outer sepals smaller and linear. Petals 5 fugacious, yellow, rarely pink or white, very rarely wanting. Stamens 5 or many, the outer sometimes sterile. Ovary usually with 3 placentae, rarely 2, incompletely septate. Style, with capitate stigma indistinctly trilobed. Capsule 3-valved, rarely 2-valved, usually pendulous. Seeds smooth, more or less roundish and angular, granular or alveolate. Includes about 50 species, the greater part natives of the Mediterranean region.

**HELIANTHEMUM ARABICUM (L.) Pers.** Plant perennial, suffrutescent, more or less pubescent with erect or prostrate stems. Leaves all alternate, lanceolate, flat or almost flat, 2-6 mm. broad, the lower smaller and closer. Stipules small, terminating in 2 or 3 longer hairs. Flowers deep yellow, terminal, solitary or few in a loose leafy cyme, with long peduncles. Outer sepals linear lanceolate, the inner ovate acuminate, 4-5 nerved. Petals longer than the calyx. Style slightly curved. Capsule with 12 seeds. (P) Mediterranean region and Arabia. March-May. *Malta*, rare, at Wied Gherzuma, St Paul's Bay, Melleha, Marfa, St George's Bay. *Gozo*, frequent at Wied ir-Rihan and Wied Bingemma. The form: *glutinosaviscosum* Parl., in which the plant is viscid in its upper parts, is also met with - *Cistus arabicus* L.-*Fumana arabica* Spach. E Arabian Sun-Rose.

**HELIANTHEMUM THYMIFOLIUM (L.) Pers.** A perennial suffrutescent plant, with dense stems, erect or ascending, more or less hairy and glandular, 1-2 dm. long. Leaves linear, with revolute margin, the upper alternate, the lower opposed, restricted towards the base, fascicled on the secondary stems or twigs. Stipules shorter than the leaves, or almost as long, terminating in a long hair. Flowers in short bracteate racemes, on pedicels as long as the calyx or slightly longer. Petals obovate, yellow. Style almost straight. Capsule with 6 seeds. (P) Mediterranean region. March-May. In arid, exposed rocky situations. *Malta*, Boschetto, Tal Ghalia, Ta Laurenti, Pualet, St Paul's Bay, Melleha, Marfa, Imtahleb. *Gozo*, Ta Cenc, Imgiar ix-Xini, Wied Bingemma, rocky ground between Ramla and San Blas, Kala, Nadur. *Comino*, rocky ground around Cala Sta. Maria.-*Cistus thymifolius* L.-*Fumana viscida* Spach.-*F. thymifolia* Burnat. E. Thyme-leaved Sun-Rose.

Var. *viride* Ten. Plant light green; pubescent and viscid only in its upper parts near the inflorescence. With the typical form, and often replacing it.

#### CISTUS (Tourn.) L.

Suffrutescent plants with trichotomous branches, and opposed leaves without stipules. Flowers in corymbose cymes, with peduncles erect after flowering. Calyx of 5 sepals, rarely 3, the outer two being like the others or larger, sometimes becoming accrescent. Petals 5 fugacious, rosy, purplish or white.

Stamens many, all fertile. Ovary with 5 parietal placentae, dividing it completely, or almost so, in 5 loculi. Style indistinctly 5-lobed. Capsule of 5 valves, erect. Seeds polygonous, scabrous or rugose, rarely smooth. Includes about 20 species mostly natives of the western Mediterranean region.

**CISTUS MONSPELIENSIS L.** Plant perennial, 2-20 dm. high, entirely villous, hirsute, glandular, and viscid in its upper parts. Leaves linear or lanceolate, sessile, 3-nerved, rugose, hairy, 5-10 mm. broad, margin slightly revolute. Flowers in unilateral racemes, with pedicles equal to the calyx, without bracts, about 2 cm. in diameter. Calyx of 5 sepals, the outer 2 oval-cordate. Petals white with yellow claw, truncated-emarginate. Style very short. Capsule rounded, septicidal at the apex. (S) South Europe, North Africa, Cyprus, the Canary Islands. March-May. Gozo, Nadur, between Wied ir-Rihan and Wied Bingemma. The form: minor Wk., with smaller flowers, and smaller leaves having very revolute margin, is also present. E. Montpellier Rock-rose I. Rembrottine.

**CISTUS INC NUS L.** A perennial bushy plant like the preceding, greyish or whitish tomentose, with stellate hairs and long simple hairs, often glandular. Lower leaves petiolate, the upper often sessile, 3-nerved, villous-tomentose, white underneath. Petioles, pedicels and stems tomentose and whitish. Leaves oval or oblong-lanceolate, often wavy along the margin, rugose above. Flowers 3-6 cm. in diameter, solitary and terminal or in small clusters of 2 or 3, on long pedicels. Sepals oval, only slightly unequal, villous and hairy, acuminate. Petals rosy, rounded or obovate, crenulate along the margin. Capsule ovoid, loculicidal, villous, rarely almost glabrous. Seeds smooth. (S) Mediterranean region. March-May. In open hilly localities. *Malta*, Wied Gherzuma, Ta Baldu, Gneina, St. Paul's bay, Wardia, Pualet. Gozo, Gnieu Imric.-*Cistus vulgaris* Spach.- *C. polymorphus* Wk.

Var. *creticus* L. Plant more viscid and more green; leaves more wavy along the margin, and less hairy; seeds rugose-reticulate. With the typical form in almost all the places above mentioned. E. Hoary Rock-rose.

#### HYPERICACEAE.

Herbs mostly perennials, often with woody stems. Leaves opposed or rarely whorled, simple entire, exstipulate, with pellucid glands and with vesicular black glands or with glandular teeth along the margin. Flowers actinomorphic, hermaphrodite, usually in terminal or dichotomous cymes. Calyx 4-5 sepals, more or less connate at the base. Petals as many as the sepals, inserted on the receptacle, sessile or furnished with a claw. Stamens inserted on the receptacle, usually indefinite, free, or forming a tube, or polyadelphous, with small subglobose introrse anthers. Ovary 3-5 celled, rarely one-celled, with 3-5 filiform styles. Ovules numerous, anatropous, rarely solitary. Fruit a capsule, septicidal, rarely loculicidal, rarely an indehiscent berry. Embryo straight or curved, exalbuminous.

The family includes 8 genera, with about 210 species, natives of warm and temperate regions.

Hypericaceae have balsamic resinous juices. The flowers of species of *Hypericum* infused in olive oil or in alcohol, to which they impart a blood red colour, make an excellent detergent or balsam used as vulnerary, chiefly for old sores and eczema.

#### HYPERICUM (Tourn.) L.

Calyx of 5 sepals Corolla of 5 yellow petals, rarely 4, sometimes furnished with a petaloid scale on the claw. Stamens many, in 3 or 5 bundles, rarely free. Ovary with parietal placentae extending inwards and dividing it into 3-5 celled capsule, dehiscing along the placentae, rarely an indehiscent berry. Seeds small, more or less cylindrical, straight berry. Seeds small, more or less cylindrical, straight or curved, striated or pitted. Includes about 160 species, dispersed in warm and temperate regions.

**HYPERICUM AEGYPHACUM L.** Plant perennial, suffrutescent, evergreen, glaucous, 1-4 dm. high, with tortuous cylindrical stems covered densely with foliage. Leaves somewhat fleshy and coriaceous, opposed, elliptical, subacute, obscurely dotted with glands. Flowers almost sessile, solitary or in small clusters. Sepals ovate, obtuse. Petals twice as long as the calyx; nectariferous scale hooded. Styles 3, sometimes 2-3 times as long as the ovary, sometimes 2-3 times shorter. Capsule ovate, unilocular: seeds oblong, striated longitudinally. (P) Ionian Islands, Algeria, Maltese Islands and Lampedusa. January-June. On rocky ground, especially not far from the sea. *Malta*, common on rocky ground along the south and south west coast. *Gozo* and *Comino*, common in same localities all along the rocky coasts.- *Triadenia aegyptiaca* Boiss.-*Hypericum heterostylum* Parl. In shady valleys it assumes an erect straggling habit; in exposed and dry situations it becomes quite dwarf. E. Egyptian St John's-wort.

**HYPERICUM QUADRANGULUM L.** Plant perennial, with erect quadrangular stems, more or less winged, branched above. Leaves with pellucid dots, opposed, oval, sessile, glabrous. Flowers in cymes forming a corymb-like panicle. Sepals ovate, obtuse, entire, glabrous. Petals twice as long as the calyx. Stamens shorter than the corolla. Capsule with several ridges on each valve. Seeds minutely alveolate. (P) Europe, Mediterranean region, Western Siberia, Canaries, Azores. April-August-H. *dubium* Leers-H. *obtusum* Moench.

Var. *tetrapterum* Fr.-*Hypericum acutum* Moench. Stems distinctly winged; flowers small, about 1 cm. in diameter, pale yellow. Sepals and petals dotted black. Leaves flat and entire, or (in the form: *undulatum* Schousb.-*Hypericum neapolitanum* Ten.) crisp and toothed along the margin, in plant with larger flowers of a deeper yellow. *Gozo*, *Pergla* and *Wied il-Lunziata*.

**HYPERICUM CRISPUM L.** Plant perennial with cylindrical stems, much branched from the base in a pyramidal shape with spreading branches, glaucous green, 2-4 dm. high. Leaves opposed, oblong, cordiform and almost amplexicaul at the base, wavy and crisp along the margin and especially at the base, with pellucid dots, and with black dots along the margin on the under side. Flowers small, solitary or in small clusters at the apex of the branches. Sepals ovate,



obtuse, mucronate. Petals 3-4 times as long as the calyx. Stamens as long as the petals. Capsule and seeds u.s. (P) Mediterranean region. May-October. *Malta*, *Gozo* and *Comino*, very common in fields, especially after harvest. E. Curled-leaved St. John's-wort. M. Fexfiex.

**HYPERICUM PERFORATUM L.** Plant perennial, green or glaucous, stems erect, stiff, with one ridge on each side, branched corymb-like above, 2-6 dm. high. Leaves opposed, sessile or subsessile, narrowed at the base, usually with pellucid dots, and with black dots along the margin. Flowers in a corymbose or paniced inflorescence. Sepals lanceolate and very acute, dotted like the leaves. Petals twice as long as the calyx. Capsule with 2 ridges on each valve, and with oblong reddish glands. Stamens and seeds u.s. (P) Europe, the Mediterranean region, Siberia, East Indies: naturalised in North America. April-June *Malta*, very rare, *Corradino*, in arid localities. E. Pitted St. John's-wort. I. Lperico, Cacciadiavoli, Erba di S. Giovanni.

**HYPERICUM HUMIFUSUM L.** Plant perennial, pale green, with slender filiform prostrate stems. Leaves opposed sessile, ovate or oblong, or linear, with black dots, but with few pellucid dots. Flowers solitary, or few in a loose corymb. Sepals and petals sometimes reduced to 4, mostly dotted black. Sepals not ciliated along the margin; petals twice as long as the sepals. Stamens shorter than the corolla; seeds u.s. (P) Central and Western Europe, North and South Africa, Madeira. May-September. *Malta*, very rare at hark il hamiem according to *Delicata* and *Gulia*. *Gozo*, according to *Gulia*. E. Trailing St. John's wort.

**HYPERICUM TOMENTOSUM L.** Plant perennial, more or less whitish and tomentose. Stems prostrate or ascending, cylindrical, 1-3 dm. long. Leaves ovate or ovate-oblong, sessile, slightly amplexicaul, with pellucid dots and with few black dots along the margin. Flowers in terminal cymes forming a loose corymb or panicle. Bracts with few glandular hairs. Petals more than twice as long as the calyx, with black glands along the margin. Stamens subequal to the petals. Capsule with many ridges. Seeds alveolate. (P) South Europe and North Africa. April-July. *Malta*, *Gozo* and *Comino*, common on rocky and uncultivated ground, along roads, in alleys; flowers more profusely in dry and sunny localities, but vegetates better in moist localities and in alleys. E. Woolly St John's-wort.

## VIOLACEAE.

Herbs or shrubs. Leaves alternate, rarely opposed, simple, petiolate, with free stipules foliaceous or deciduous. Flowers usually zygomorphic, hermaphrodite, axillary, solitary or in cymes, usually on a pedicel with 2 bracteoles. Sepals 5, distinct or connate at the base, with imbricate aestivation. Petals 5, more or less hypogynous, equal or unequal, clawed or connivent at the base, the inner one being often larger and spurred. Stamens 5, inserted on the receptacle with very short dilated filaments, free or connate at the base, with 2-celled introrse anthers connivent around the ovary. Ovary free, sessile, one-celled, with a simple style and stigma this being rarely 3-5 fid: ovules usually many, anatropous. Fruit a capsule, rarely a berry. Seeds with a straight central embryo in a fleshy abundant albumen.

The family includes 21 genera, with about 240 species, natives of warm and temperate regions.

Violaceae have emetic and laxative properties; the flowers of *Viola odorata* are emollient and demulcent. The root of *Lonidium Ipecacuanha*, the white ipecacuanha of commerce, is strongly emetic, and is also used as depurative. The plant of *Viola tricolor*, the common pansy, is sometimes taken internally in infusion as a depurative in skin eruptions.

### *Viola* (Tourn.) L.

Calyx of 5 sepals, prolonged beyond their insertion. Corolla of 5 unequal petals, sometimes wanting, the lower petal usually larger and spurred. Stamens 5, with very short filaments, and with the connective pro-longed into a scale, the lower 2 with a nectariferous appendix at the base of the filament. Ovary unilocular, with 3 parietal placentae. Style short, curved. Capsule 3-valved, loculicidal, dehiscing with elasticity. Seeds many, with a caruncle. Includes about 100 species, distributed broadly in temperate regions.

**VIOLA HIRTA L.** Plant perennial herbaceous, stemless, with oval leaves, or more or less rounded, cordate at the base, crenate. Stipules oval-lanceolate, acinate, glandular. Petioles long and hairy. Rhizome usually without stolons. Flowers usually scentless, violet or mauve, often whitish at the base, rarely white, on long peduncles with 2 bracteoles, glabrous or hairy, sometimes apetalous, with a prominent spur longer than the appendix of the calyx. Stigma hooked and acute. Capsule almost trigonous. (P) Europe, Asia as far as Japan North Africa, the Canaries, Madeira, January-May. E. Violet. I. Violetta. M. Viola

Var. *odorata* L. Rhizome stoloniferous, and often with prostrate stems, usually rooting. Stolons slender, long, usually flowering in the second year. Stipules oval and broad, almost entire. Flowers more or less sweet-scented, usually violet, sometimes mauve or white with a mauve or bluish spur. *Malta*, rare, Imtahelb, Gneina, boschetto, Ghain il Cbira, Ghirghenti, San Antonio Gardens etc. *Gozo*, also rare, in the Migiarro valley, according to Duthie. The form with white flowers and bluish or mauve spur is met with at San Antonio Gardens, Casa Leoni, gardens at Lia and Attard etc. Commonly cultivated.

**VIOLA TRICOLOR L.** Plant annual or biennial, with erect or ascending stems, angular, simple or branched. Leaves toothed, petiolate, the lower rounded or oblong, the upper narrower; stipules lyrate or pinnatifid, with a large terminal lobe. Flowers scentless, yellowish-white shaded violet along the margin, or pale yellow. Sepals lanceolate acuminate. Lower petal obcordate or emarginate, with a spur about as long as the appendix or the sepals. (A) or (B) March-June. Europe, North and Western Asia, North Africa, the Canaries: naturalised in North America and South Africa. E. Pansy. I *Viola di tre colori*. M. Pensieri.

Var. *parvula* Tin-*Viola tricolor* var. *Bellioides* D.C.-V. *tricolor* var. *minima* Bert. Leaves almost entire; sepals oval-lanceolate. Petals yellowish white with a violet throat; spur shorter than the appendix of the sepals. Plant hirsute. *Malta*, very

rare, on Corradino Hill, according to Duthie; in fields at Attard and Lia in single specimens.

The variety: *hortensis* D.C., bearing large flowers of various shades, is the pansy of gardens. It is sometimes met with self-sown in gardens and on heaps of rubbish.

## ORD. COLUMNIFERAE.

### MALVACEAE.

Herbs, shrubs or trees, with alternate simple leaves, usually palminerved, having 2 lateral stipules. Flowers actinomorphic, hermaphrodite, mostly axillary, solitary, or glomerate, sometimes in a terminal raceme, corymb or panicle. Calyx usually 5-lobed, valvate, very generally with an involucl of whorled bracts. Corolla contorted, or as many petals as the lobes of the calyx, adnate at the base. Stamens hypogynous, indefinite, usually monodelphous, with filaments forming a tube through which passes the style. Anthers one-celled, with spinescent pollen. Ovary typically of 5 carpels, which may become multiple. Fruit rarely a berry, usually a dry capsule, breaking up into loculi, each enclosing a reniform seed with a curved embryo.

The family includes 59 genera, and over 700 species distributed chiefly in the warmer regions of both hemispheres. Many species contain a mucilaginous principle, more abundant in their roots, and are therefore emollient. *Hibiscus esculentus* L., the ochro or gombo (M- bamja) is often grown in our gardens for its green capsules which are much esteemed as a vegetable. *Gossypium herbaceum* L., is the Cotton-plant cultivated in these Islands since Phoenician days; *Gossypium religiosum* also cultivated since time immemorial, furnishes the Nankin or Red Cotton, and *Gossypium hirsutum* L, furnishes the West Indian cottons. The tree-cottons, *Gossypium peruvianum* L. from South America and *G. arboreum* from India, are grown more as curiosities, although they also furnish cotton of good quality. The Malvaceae include also the gigantic Boabab (*Adansonia digitata*), the Durian (*Durio zibetinus* of Malasia, and the Kapoc tree, *Eriodendron anfractuosum* and other species. Many species of *Hibiscus*, *Althaea*, *Malva*, *Malope*, *Abutilon* and *Sida* are grown for ornament.

### TRIBE I-MALVEAE.

At dehiscence carpels separating completely from the axis of the flower.

### MALOPE L.

Annual herbaceous plants, becoming woody at the base. Involucl consisting of 3 free bracts, cordate-ovate, inserted on the peduncle. Calyx divided into segments. Corolla of 5 petals, connivent at the base of the staminal bundle. Stamens many, monodelphous, forming a tubular column. Ovaries many, free, irregularly inserted around a conical receptacle, each containing ovule. Styles many, free or connivent below, each terminating in a long lateral stigma. Carpels

indehiscent, each with one seed, inserted all over a globose receptacle. Species 3, natives of the Mediterranean region.

**MALOPE MALACHOIDES L.** Plant annual, glabrous, or slightly hairy. Stem erect or ascending (1-3 dm.), branched. Leaves alternate, oval or oblong or almost cordate, obtuse, crenate or somewhat cut, sometimes trifid or tripartite, with a long petiole. Stipules ovate-lanceolate, or ovate-cordate (form: stipulacea Cav.) always more or less acute or acuminate. Flowers large, on a long peduncle, solitary, axillary. Petals 2-3 times as long as the calyx, somewhat emarginate, rosy-pink, with darker veins. (A) Italy, Sicily, Sardegn, Spain, France, Greece, Asia Minor, North Africa, region between the Caspian and the Black Sea. April-June. In moist clayey fields and valleys, but rather rare *Malta*, at Gneina, Imtahleb, Ghain Rihana, Ghain Tuffieha, San Martin, Wardia. *Gozo*, Wied il-Lunziata and Pergla. The form stipulacea Cav., is found at Gneina. *E. barbery* Mallow-wort.

#### ALTHAEA (Tourn.) L.

Herbs annual or perennial, with an involucre of 5-12 whorled bracts, connate below, and inserted on the peduncle. Calyx with 5 segments. Corolla u.s.; stamens u.s. Ovaries many, free, inserted in a ring, each with 1 ovule. Styles u.s. Carpels numerous, indehiscent, arranged in a ring, and each containing one seed. Species 12, natives of the temperate regions of the Old World, and rarely found in the tropics.

**ALTHAEA HIRSUTA L.** Plant annual, hirsute, 1-4 dm. Stem erect, usually branched. Leaves alternate, petiolate, palmately-5-lobed; the lower somewhat cordate, with 5 toothed and obtuse lobes; the upper leaves divided into 5 to 3 oblong or lanceolate, acute segments, also toothed. Stipules persistent. Flower-stalks one-flowered, axillary, solitary, longer than the leaves. Involucre of 7-9 lanceolate or linear segments. Petals pink or bluish pink, somewhat truncated. (A) Central Europe and the Mediterranean region. March-May. In exposed and open situations. *Malta*, at Gneina, Pualet, Marfa, Ghain Tuffieha, Wied Encita. *Gozo*, at Pergla il Cbira, Xaghra, nadur, Wied ir-Rihan and Wied Bingemma. *Cominot* and *Cominotto*. Nowhere common except at Comino. At Comino, Cominotto and Xaghra, the plant has generally a simple stem, 5-10 cm.

**ALTHAEA OFFICINALIS L.** Plant whitish or ash-coloured owing to a thick tomentum, 3-15 dm. stem erect, generally branched. Leaves alternate, petiolate, palmately-5-lobed; the lower somewhat cordate, the others oval, obtuse or acute, toothed, and often 3-5 lobed. Stipules deciduous. Flower-stalks solitary or in pairs, axillary, shorter than the leaves, each bearing one or two flowers. Involucre of 7-12 ovate-lanceolate segments, shorter than the calyx. Petals 2-3 times as long as the calyx, emarginate, flesh-pink or purplish. (P) Mediterranean region and Central Europe as far as Siberia. May. *Gozo*, Xlendi, according to Gulia, but not collected by others. *E. Marsh Mallow*. *I. Altea*, *Malvaconi*.

**ALTHAEA ROSEA (L.) Cav.** Plant perennial, flowering in the second year, with annual stems (1-2 m.), very hirsute. Leaves alternate, petiolate, palmately-5-lobed, the lower rounded and cordate, with 5-7 broad shallow lobes, obtuse and crenate;

the upper smaller and with longer lobes. Stipules deciduous. Flower stalks much shorter than leaf, solitary or 2-4 together in the axils. Involucre of 5-7 segments, about subequal to the calyx or shorter. Petals almost rounded, obcordate, pink in the typical form. (P) native of Greece, Macedonia, and Crete. April-June. Cultivated in many forms, and often naturalised in its typical form in old gardens-Alcea rosea L. E. hilly hock. I; Malvarosa, Rosoni, Malvoni. M. Bastun ta San Giusepp.

## LAVATERA (Tourn.) L.

Annual or perennial plants, more or less tomentose or hirsute, woody below; with alternate, petiolate, palm-nerved leaves. Involucre of 3, sometimes 2, bracts connate at the base, and inserted on the peduncle. Calyx of 5 segments. Corolla of 5 petals united at the base forming a ring along with the tube of the stamens. Stamens many, monodelphous, with filaments forming a tube for the styles. Ovaries numerous, free inserted in a circle, each with one ovule, and with a free style, the styles being united only at the base. Carpels many, indehiscent, each with one seed. Species 18, natives chiefly of the Mediterranean region and Western Europe.

LAVATERA ARBOREA L. Plant perennial, woody at the base, erect, branched, very tomentose, 1-3 m. Leaves cordate-reniform, with 5-7 obtuse or acute, toothed lobes. Flower-stalks axillary, clustered, much shorter than the leaf. Involucre longer than the calyx and accrescent. Petals bilobed, purple or violet (S) Mediterranean region; naturalised elsewhere. March-June. *Malta*, frequent but not common, at Zurrigo, Birzebbugia, Floriana, Wied Encita, Notabile, Wied Kirda etc. *Gozo*, Migiarro, Ghainsielem, Xlendi, Xaghra. Apparently native, or at least long naturalised. E. Tree-Mallow. I. Malvone.

Forma crispa mihi. Leaves larger than the type, very finely wavy and crisp along the margin. With the typical form at Wied Kerda.

LAVATERA CRETICA L. Plant annual or biennial somewhat tomentose or hirsute (2-10 dm.), erect or ascending, usually branched. Leaves roundish and cordate; the lower indistinctly 5-7 lobed; the upper with 5 acute lobes: lobes toothed. Flower-stalks axillary, clustered, one-flowered, much shorter than the leaves. Calyx longer than the involucre, which is only slightly tescrescent. Petals bilobed red or purple. (B) Mediterranean region, the Canaries, Madeira. February-May. In fields, gardens, on heaps of rubbish, along roads etc. *Malta*, frequent everywhere. *Gozo*, frequent near Ghainsielem and Xeuchia, scarce elsewhere. *Comino*, Cala Sta Maria.

LAVATERA TRIMESTRIS L. Plant annual, light green, hirsute; with an erect stem simple or slightly ramified above (2-8 dm). Leaves alternate, palminerved, with a long petiole; the lower round-reniform, crenate, indisictly 3-lobes, the upper hastate, 3-lobed, serrated, lower-stalks axillary, solitary, 1-2 flowered, equal to the leaf or longer. Flowers large, petals light pink or violet, slightly emarginate, veined purple. Receptacle in the mature fruit protruding above the carpels forming an expanded and concave disk. (A) South Europe, North Africa, Syria. April-July. Frequent but not common. *Malta*, Boschetto, Imtahleb,

Gneina, Ghain Tuffieha, Puales, Ghain il Cbira, Ghirghenti, Wied Kirda, Hemisia. Gozo, Zebbug, Pergla Xlendi-Stegia trimestris Risso, St. Lavatera D. C.-Lavatera grandiflora Moench. The form alba Parl. with white flowers is met with at Boschetto and Ghirghenti.

#### MALVA (Tourn.) L.

Plants herbaceous, annual or perennial, usually hirsute or tomentose; with alternate, simple, palminerved leaves. Involucre of 3 distinct bracts, inserted at the base of the calyx. Calyx with 5 broad lobes. The rest u.s. Species about 16, natives of Europe, North Africa, and extra-tropical Asia: naturalised elsewhere.

MALVA CRETICA Cav. Plant hirsute, annual, with an erect or prostrate stem, simple or branched from the base (5-50 cm). Leaves alternate, petiolate, palminerved, with 3-7 broad crenated or serrated lobes. Flower-stalks axillary, solitary, one-flowered. Involucre of three distinct linear bracts. Corolla as long as the calyx or twice as long, pink veined darker, rarely white. Carpels glabrous externally, transversely rugose laterally one-seeded. (A) Southern Europe, Crete, Tunisia and Cyprus. The typical form is peculiar to Crete. E. Mallow. I. Malva. M. Hobbeiza.

Var. althaeoides Cav. Upper leaves deeply 3-5 partite, down to the base, with lanceolate segments-Malva hirsuta Ten. Common everywhere in Malta, Gozo, Comino and Cominotto. March-June. In arid localities it remains very dwarf, hardly exceeding 5 cm. The form albiflora Presl., with white flowers is occasionally met with in valleys.

MALVA SILVESTRIS L. Plant annual or biennial hirsute or almost glabrous, with an erect or prostrate stem, usually very branched (1-6 dm.) Leaves alternate petiolate, palminerved, rounded-cordate, crenate, broadly divided into 5-7 shallow lobes. Involucre with 3 distinct oblong or lanceolate bracts. Large corolla, 3-4 times as long as the calyx, pink or violet-pink with darker veins. Carpels reticulate-rugose externally. (A) or (B) Europe, North Africa, Western Asia and Siberia; naturalised elsewhere. February-May. Very common in fields along roads, on the glacis of Valletta and Floriana, in valleys, in exposed rocky localities etc. Common also in Gozo and Comino. E. Common mallow. I. Malya M. Hobbeiza. The same term (hobbeiza), is applied to all species of Lavatera and Malva.

Var. erecta Gilib.-malva polymorpha Guzz. M. hirsuta. Viv. Non Ten. Plant more or less erect tomentose or almost glabrous. Carpels densely tomentose. With the species but less common. Var. ambigua guss. Plant with stellate hairs. Flower-stalks as long as the leaf or longer. With the species, but less common than the preceding variety.

MALVA NICAENSIS All. Plant hirsute, annual, with an erect or prostrate stem, simple or branched, (1-5 dm.) Leaves alternate, petiolate, palminerved, rounded coriaceous, crenate, with 5-7 often indistinct lobes. Involucre 3, distinct ovate-lanceolate bracts. Corolla about or twice as long as the calyx, bluish. Carpels glabrous or pubescent, externally reticulate-rugose. (A) Mediterranean region

and the Caucasus. March-July. Common in *Malta* and *Gozo*, along roads, near buildings and on heaps of rubbish. The form with white flowers (f. *arvensis* Presl) is also met with occasionally. -malva circinnata Viv.-M. rotundifolia Z. ex Del.

**MALVA PARVIFLORA L.** Plant annual, sub-glabrous or somewhat hirsute or tomentose, with an erect or prostrate stem. Leaves alternate, petiolate, palmately-veined, rounded-cordate, crenate, with indistinct lobes. Flower-stalks, axillary, unequal. Involucre of 3 distinct linear bracts. Corolla about as long as the calyx, this last being often accrescent and reddish after flowering. Petals light-pink or mouse. Carpels with margins toothed and winged, reticulate-rugose externally, smooth or pubescent. (A) Mediterranean region, Central Asia, Canaries, Madeira.

Var. *flexuosa* Horn. Non Gill. Plant with many prostrate and flexuose stems. Calyx accrescent, reddish and patent after flowering. March-June. Very frequent in fields and along roads, in *Malta*, *Gozo* and *Comino*.

Var. *microcarpa* Desf.-malva *Bivoniana* Presl. Plant with ascending or prostrate stem. Calyx remaining green and little accrescent after flowering. March-June. Frequent in fields among growing crops, and especially in gardens, in *Malta* and *Gozo*.

#### ABUTILON (Tourn.) L.

Woody shrubs with alternate, simple, petiolate, palmately-veined, stipulate leaves. Involucre wanting. Calyx 5-cleft. Corolla of 5 petals, connate at the base, forming a ring with the tube of the stamens. Stamens numerous, monodelphous, forming a tube for the styles. Ovaries numerous, free at the apex, inserted in a circle, each with 3-9 ovules. Styles numerous, united only at the base. Capsule of many carpels disposed in a circle or crown, dehiscent by their dorsal suture, each containing several seeds. Species about 80, natives chiefly of the tropical and sub-tropical regions of both hemispheres.

**ABUTILON AVICENNAE Gaertn.** Plant very hairy and tomentose, soft to the touch. Stem erect, branched above (3-30 dm.) Leaves rounded-cordate, or somewhat oblong-cordate, crenate, acuminate. Flower-stalks axillary or terminal shorter than the leaves, 1-3 flowered. Calyx with broadly oval lobes. Corolla yellow, slightly longer than the calyx. Capsule of numerous velvety carpels, disposed like a crown, of a dark colour, each carpel at dehiscence terminating in a bifid apex. (A), (P) or (S) South of France and Italy to the Caucasus and Turkestan. April-November. *Malta*, probably an escape from gardens. Naturalised on the fortifications and in the ditches of Valletta and Floriana, and also in old gardens. Occasionally found growing in fields of cotton at Tal Mirasli and Ta Vnezia, near Lia-Sida Abutilon L. E. Lantern-Flower. I. Cencio Molle. M. Sida musuafa.

**ABUTILON BEDFORDIANUM A. St. Hilaire.** Native of Brazil, a shrubby plant of smaller dimensions, with yellow flowers and smaller dark green leaves, finely

tomentose, is naturalised in San Antonio Gardens, probably imported with other seeds.

## HIBISCUS L.

Plants annual or perennial, or small trees, with leaves alternate, petiolate, stipulate palminerved, or at least with 3 primary nerves. Flowers axillary or terminal. Involucre of 6-12 free bracts, inserted on the peduncle. Calyx 5-cleft. Corolla of 5 petals, connate at the base forming a ring with the base of the staminal tube. Stamens numerous, monodelphous, forming a tube for the style. Ovary 5-locular, each carpel with 1 or more ovules. Style 5-cleft above, each branch finishing in a capitate stigma. Capsule 5-locular, each cell with 1 or more seeds. Seeds smooth or hairy. Species about 160, natives chiefly of tropical and sub-tropical regions.

HIBISCUS TRIONUM L. An annual, herbaceous plant, with an erect or prostrate stem, simple or branched at the base, softly hairy (1-3 dm) Leaves palminerved, the basal leaves being roundish, crenate and fugacious, the next trilobed, and the upper 3-5 lobed, deeply divided almost to the base, with oblong toothed segments. Flower-stalks axillary, solitary, one-flowered, shorter than the leaf. Involucre of linear-setaceous bracts. Calyx with 5 segments broadly triangular; accrescent forming a membranous bladder. Petals pale-yellow, purple at the base. Capsule pluricarpellary, many seeded; seeds smooth. (A) Italy, Sicily, Spain, Dalmatia, Austria, Balkan Peninsula, South Russia, Western Asia, naturalised elsewhere. July-September. *Malta*, melleha, Ghain il Cbira. *Gozo*, Pergla, Wied il Lunziata. In fields of cotton, according to Gulia.

## GOSSYPIUM L.

Herbs or small shrubs, with erect woody stems, annual or perennial. Leaves alternate, simple, palmi-nerved, petiolate, stipulate, more or less divided into 3-5 lobes. Involucre of 3 large, distinct, usually laciniate bracts. Calyx hardly 5-toothed. Corolla of 5 petals, connate at the base u.s. Ovary 3-5 locular, each cell with several ovules. Style club-shaped, with 5 grooves at the apex. Capsule 3-5 locular, with oval black seeds pointed at one end, and densely covered with long hairs. Species about 10, natives of the warmer regions of the world.

GOSSYPIUM HERBACEUM L. Plant herbaceous, annual, biennial or even perennial, almost glabrous or almost hirsute, with an erect stem and branches spotted black (4-12) dm.) Lower leaves rounded-cordate, 5-lobed, the upper leaves oval-cordate, 3-5 lobed. Lobes narrower at the base, with a rounded sinus between the lobes which are entire or slightly toothed. Flower-stalks axillary, solitary, one-flowered, shorter than the leaf. Flowers sulphur-yellow, with a purplish spot at the base of each petal. Ovary usually 5-locular. Capsule globose acuminate, usually 5-celled. Seeds black with long white hairs and shorter white hairs firmly attached to the testa. July-September. (A) or (B) Native of India cultivated in these Islands since Phoenician days, but never found naturalised or even subsponaneous. E. Indian or Short-stapled Cotton, Common Cotton, I. Cotone. M. Koton Malti, Koton ta Malta. In low lying clayey and most districts, this species has become too liable to suffer from a fungus.



*Necosmospora vasinfecta* (Atk.) Smith, which attacks the roots and the stem and kills the plant, usually when about to flower.

**GOSSYPIUM HIRSUTUM L.** Plant u.s., hirsute. Stems and branches usually reddish and spotted black, (4-12 dm.) but usually shorter than *G. herbaceum* grown together. Leaves u.s. usually 5-lobed, upper leaves 3-lobed, lobes large, broad, triangular, acute, with an acute sinus between the lobes, with reddish petiole, and sometimes reddish veins. Flowers u.s., sulphur-yellow, or creamy yellow, often without black spots at the base of the petals, tinted reddish on the outside. Ovary and capsule, 3-5 locular, 3-locular or 4-locular in certain varieties, 5-locular in others: more or less oval-acuminate. Seeds u.s. densely covered with long white hair, sometimes tinted reddish, with or without short hairs, often tinted green, firmly attached to the testa. (A) or (B) Native of the East. July-September. Extensively cultivated especially in Egypt and in North America. Also present extensively cultivated in Malta and Gozo, under the name of Koton ta Gallipoli.

Var. *religiosum* L. Plant, stem and leaves u.s. with lobes less acute and somewhat rounded at the sides. Flowers u.s. more reddish on the outside. Capsule 4-5 locular; seeds with long reddish hair, turning darker with age, and with short hairs tinted green firmly attached to the testa. E. Nankin Cotton, I. Cotone nankin or Cotone Rosso. M. Koton ahmar Koton Isanche' or Nanke'. Cultivated for ages, but always on a reduced scale, for household fabrics.

## ORD. GRUINALES.

### GERANIACEAE.

Herbs, annual or perennial, sometimes undershrubs, with opposed or sometimes alternate leaves, simple or more often variously divided or compound, with toothed margin, and usually furnished with stipules. Flowers hermaphrodite, actinomorphic, rarely zygomorphic; sepals 5 imbricate in the bud, or in irregular flowers consisting of 5 or even 4 lobes with a gamosepalous calyx. Corolla of 5 petals, contorted in the bud; rarely consisting of 4 petals. Stamens 5 to 10, usually monadelphous, or 5 stamens and 5 staminoids, monadelphous or distinct; rarely reduced to 4 stamens. Ovary 5-locular with 1 style, style, sometimes 5-10 locular with 5 styles or even 4-locular with 4 styles. Fruit a capsule variously modified. The family includes 28 genera, and over 800 species, broadly distributed all over the world, mostly in temperate and subtropical regions.

Several exotic species are cultivated for ornament or for perfumery. *Geranium Robertianum* and *G. rotundifolium* are occasionally used in domestic medicine as tonics and astringents. *Erodium moschatum* owing to its strong aroma, is sometimes used in infusion as an excitant and diaphoretic. The common flax, *Linum usitatissimum* is largely cultivated in many countries for the fibre of its stem (flax and Fnen), and for its seeds which contain a valuable fixed drying oil (linseed oil) much used by painters etc, the flour resulting after the expression of

the oil being often used for linseed poultices. 1. Pelargonium. 2. Geranium. 3. Erodium. 4. Oxalis. 5. Linum.

#### TRIBE 1-GERANIEAE.

Carpels separating from the axis of the gynoccium, to which they remain attached by means of an appendix, which become curved or twisted.

#### PELARGONIUM L'Her

Herbs suffruticose or frutescent, often viscid and sweet-scented, sometimes fleshy. Leaves simple, opposed or alternate, entire or not, stipulate. Peduncles axillary, opposed to the leaves, with a false umbel having 2 or more flowers, rarely one-flowered. Flowers actinomorphic or slightly zygomorphic. Sepals 5 imbricate, connate at the base, the posterior furnished with an adnate spur. Petals 5 or less imbricate, the upper two differing from the others. Disk without glands. Stamens 10, hypogynous, connate at the base, oblique, 7 or rarely 2 to 6 furnished with anthers, the others without anthers or anortive. Ovary 5-lobed, 5-celled, with a beak finishing in a style and 5 introrse stigmas. Capsule 5-lobed, each with one seed, caudate, the tail or part of rostrum twisting spirally at dehiscence. Seeds exalburhinose. Includes about 170 species, mostly natives of South Africa, 3 being found in North Africa and the East, 2 or 3 in Australia and New Zealand.

PELARGONIUM GRANDIFLORUM L. A suffruticose plant, 4 to 6 dm. high, erect, branched, with stiff hairs or bristles. Leaves alternate, roundish-reniform, more or less lobed or toothed, and pubescent. Flowers many in fairly large false-umbels. Petals purplish rose, the lower three spotted carmine and dark purple. (P) South Africa. April-May. *Malta*, commonly cultivated in many varieties and forms. The typical form is naturalised on old walls and rock-fissures in the Boschetto, on the side known as "Ta Rapa". M. Geranju.

PERARGONIUM INQUINANS Ait. Plant erect, suffruticose at the base, with thick stems, somewhat fleshy, up to 2 m. high. Leaves orbicular, entire, sinuate or toothed, pubescent as also the stems, leaving a rusty spot on the fingers when bruised. Flowers in false umbels, rather small, scarlet or velvety scarlet, the two upper petals narrower than the others. (P) Island of St Helena. Flowers almost all the year. *Malta*, cultivated, and naturalised here and there in old gardens, courtyards etc. M. Sardinella salvagga.

PELARGONIUM ZONALE W. and P. peltatum Ait, are cultivated in many varieties and hybrid forms. The first is often met with self-sown and almost naturalised.

#### GERANIUM (Tourn.) L.

Herbs annual or perennial, with dichotomous stems usually swollen at the nodes. Leaves opposite, simple, palmate, more or less deeply divided. Flowers purplish, solitary or few forming a bracteate umbel on long axillary peduncles. Calyx of 5 sepals; corolla of 5 petals, actinomorphic. Stamens 10,

monodelphous at the base, all furnished with anthers. Ovary of 5 carpels with 2 ovules in each. Style 1, long, with 5 filiform or curved stigmas. Fruit, a capsule of 5 carpels, each containing only one seed. Species about 160 broadly distributed in the temperate regions of the northern hemisphere,

**GERANIUM ROBERTIANUM L.** Plant annual, sometimes biennial, more or less glandular and pubescent, with a resinous or disagreeable odour. Stem erect, or ascending, branched dichotomously, more or less reddish as also the petioles (1-4 dm.) Leaves palmatifid, broader towards the middle, with 3-5 segments, deep green, with the segments tripartite or pinnate. Peduncles 2-flowered, usually as long as the leaves or longer; pedicels shorter than the calyx. Petals glabrous, entire or slightly crenate. (A) or (B) Mediterranean region, all Europe to Siberia and India, Canary Islands, Madeira, North America and Chili. February-May. Frequent in Malta, Gozo and Comino, on rocky wastes, valleys, walls of fields; sometimes common in shaded situations.-*Geranium foetidum* Gilib.-*Robertium vulgare* Picard E. Herb-Robert.

Var. *purpureum* Vill. Petals less than twice the length of the sepals. Anthers yellow, not orange as in the typical form. Common at Boschetto, Wied Encita etc. A white-flowered form (f. *albiflorum* Lev.) is occasionally met with.

**GERANIUM LUCIDUM L.** Plant annual, almost glabrous, of a shining green colour. Stem erect or prostrate, (1-4 dm.) Leaves palmatifid, broader towards the apex, with reddish petiole. Peduncles 2-flowered always longer than the leaves. Petals entire or emarginate, less than twice the length of the sepals. The rest u.s. (A) Almost same distributions as the preceding species. February-May. Frequent on walls and shaded localities at Boschetto, Wied Gherzuma etc.-*Robertium lucidum* Picard.

**GERANIUM MOLLE L.** Plant annual or biennial, pubescent or glabrous, often with glandular hairs. Stem prostrate or erect, simple or dichotomous (2-90 cm.) Leaves palmatifid, with 5-9 lobes, the cauline alternate with reduced lobes, the lobes being broadest at the apex. Stipule oval or lanceolate. Peduncles 2-flowered, pedicels longer than the calyx; petals bilobed, hairy at the base; filaments glabrous; carpels glabrous with a rugose surface. (A) or (B) Europe, Central and Western Asia, North Africa, Canary Islands, Madeira, naturalised in North America. February-April. Very common on waste ground and in country roads in Malta, Gozo and Comino.

**GERANIUM ROTUNDIFOLIUM L.** Plant pubescent and partly glandular. Stems prostrate or erect., spreading (2-5 dm.). Leaves palmatifid or palmatopartite, with 5-9 lobes more or less deeply and symmetrically cut, broadest at the apex. Stipules oval-lanceolate or lanceolate, acute. Peduncles 2-flowered, shorter than the leaves; pedicels longer than the calyx, reflexed when in fruit. Petals entire, 1½ times the length of the sepals, mauve, or rarely white: filaments glabrous; carpels hairy, not rugose (A) or (B) Distribution u.s. February-April. Frequent in fields, valleys, and waste grounds in Malta; more frequent in Gozo and Comino.-*Geranium malvaefolium* Gaertn.-*G. viscosum* Gilib.-*G. viscidulum* Fr.

GERANIUM DISSECTUM L. Plant somewhat hairy and glandular. Stems erect or ascending, dichotomous (1-4 dm.) Lower leaves deeply palmatopartite, the upper palmatifid, with 5-7 lobes. Stipules broadly lanceolate, acuminate. Peduncles 2-flowered, shorter than or subequal to the leaves. Petals deep purplish, rarely white, emarginate, subequal to the sepals. Filaments ciliated at the base. Carpels not rugose with glandular hairs. (A) or (B) Distribution u.s. February-April. Frequent in gardens and shaded valleys, in Malta and Gozo.-*Geranium angustifolium* Gilib.

#### ERODIUM L'Herit.

Herbs annual, biennial or perennial; with radical leaves forming a rosette, the cauline leaves when present being opposed. Leaves usually ovate or ovate-lanceolate, more or less pinnatifid or bipinnatifid. Peduncles axillary or almost radical, 1-14 flowered. Filaments 5 with anthers, and 5 without anthers or rudimentary, alternate with the first 5. Carpels with awns bearded on the inner side, and spirally twisted at dehiscence. The rest as in *Geranium* Species about 50, mostly of the Mediterranean region and Europe.

ERODIUM CHIUM (Burm f.) Willd, Plant more or less pubescent or hispid, often with glandular hairs. Stem prostrate or ascending, branched (1-6 dm.) Leaves roundish, oval or oval-oblong, usually cordate at the base. Stipules oval acute, whitish or reddish. Peduncles equal or subequal to the leaves, with 2-8 flowers. Sepals terminating in a short awn. Petals often somewhat unequal, longer than the calyx, purplish, pink or occasionally white. Carpels hairy, with spreading or erect hairs, and with 2 non-glandular pits at the apex. (A) or (B) Mediterranean region, Afghanistan, the Canaries and Madeira. February-April. *Malta*, in fields and uncultivated ground at Wied Ghomor, Imtahleb, Wied Encita, Ghain Tuffieha, Melleha. Not frequent. *Geranium chium* L.

Var. *laciniatum* Willd. Plant hispid or almost glabrous. Leaves all more or less deeply pinnatifid, with toothed or cut lobes. Stipules obtuse.-*Geranium Inciniatum* Cav-Erodium affine Ten.-*E. cinerascens* Moris. February-April. Often considered as a distinct species, owing chiefly to its preferred habitat, being found almost exclusively on sandy soils close to the sea. *Malta* and *Gozo*, Marfa, Melleha, St. Paul's Bay, Bahar ic-Ciaghak, Xlendi, Ramla, Kbaijar, but nowhere common.

ERODIUM MALACHOIDES (L.) Willd. Plant pubescent and partly glandular. Stems prostrate or erect, branched (1-7 dm.) Leaves cordate at the base, oval or oblong, rather obscurely trilobed, with crenate lobes. Peduncles with 3-8 flowers, equal to or slightly longer than the leaves. Sepals short-awned: petals mauve or light pink, subequal, entire or hardly toothed. Carpels with spreading hairs, with 2 pits at the apex furnished with minute glands. Fruit with a beak 2-3 mm. long. (A) Same distribution as above. January-April. Along roads in fields, valleys and waste lands. Common in *Malta*, *gozo*, *Comino*, *Cominotto*-*Geranium malachoides* L. *Erodium commutatum* Tod.

Var. *subtrilobum* Jord. Leaves smallest with median lobe-trilobed. Fruit with a beak only 2 mm. long. Replaces the typical form in dry and arid localities.

**ERODIUM BOTRYS** (Cav.) Bert. Plant hispid and glandular in its upper parts. Stems prostrate or ascending slightly ramified (1-5 dm.) Leaves pinnatifid with oblong crenate lobes. Stipules oval, acute or acuminate. Peduncles with 1-4 flowers, as long as the leaves. Sepals shortly awned. Petals purplish violet, u.s. Carpels with erect hairs. (A)-*Geranium Botrys* Cav. South Europe, North Africa, Canaries, Madeira. April. Ta Harrax, Gozo, according to Gulia: possibly the form *brevicaule* Rouy, which is practically stemless.

**ERODIUM CICONIUM** (L.) Willd. Plant pubescent, with glandular hairs. Stems ascending or erect, branched, (2-6 dm.) or very short (form *brevicaule* Bert.) Leaves pinnatifid, the upper lobes decurrent on the rachis; lobes oblong, toothed. Stipules oval, terminating in an awn-like point. Peduncles with 1-7 flowers, about the length of the leaves. Sepals drawn in an awn 2-5 mm. long. Petals only slightly longer than the calyx, purplish violet or occasionally white (form *albiflorum* Gouan). Staminodes ciliated above; fertile stamens ciliated at the base. Carpels with hairs, partly long and spreading, and partly short and glandular, with 2 semi-circular pits at the apex. Fruit with a beak 6-8 cm long. (A) South Europe, Hungary, West Asia, North Africa. March-April. Wied Balluta and Corradino (Malta), according to *Delicata-Geranium Ciconium* L.

**ERODIUM MOSCHATUM** (Burm. F.) L'Herit Plant very pubescent and velvety, occasionally almost glabrous, glandular in its upper parts, with a strong musky scent when bruised. Stems prostrate or ascending, (1-4 dm) Leaves large ovate-oblong, pinnatifid, with oblong toothed segments often with large red or brown spots close to the midrib. Stipules roundish or obtuse, slightly mucronate. Peduncles with 2-8 flowers, sometimes twice as long as the leaves. Petals violet red, slightly hairy on the claw. Filaments all glabrous. Carpels with spreading hairs, with 2 roundish pits at the apex surrounded by a crest. Fruit with beak about 3½ cm. long. (A) or (B) South and West Europe, West Asia, North Africa, Abyssinia, Canaries, Madeira; naturalised elsewhere. December-May. Very common along roads and on uncultivated ground, as well as in fields, in Malta, Gozo and Comino-*Geranium moschatum* L. A white-flowered form (*f. albiflorum*) is met with frequently. E. Musk Heron's Bill. M. Haxixa tal Misk.

**ERODIUM CICUTARIUM** (L.) L'Herit. Plant tomentose, pubescent or almost glabrous. Stems erect or ascending, branched (¼-5 dm.), sometimes almost stemless. Leaves 1-2 pinnatifid, or rather 1 pinnatifid, with pinnate or lobed segments. Peduncles with 2-9 flowers, usually longer than the leaves. Stipules acute or acuminate Petals as long as the sepals or twice as long, red or mauve, or pink, sometimes white, almost entire, hairy on the claw. Filaments glabrous. Carpels hairy, with 2 roundish pits at the apex: beak 2-5 cm. long. (A) or (B) Central and Southern Europe, North Africa, North West and Central Asia, Abyssinia, Canaries, Madeira; naturalised elsewhere. November-May. Very common everywhere, in Malta, Gozo and Comino.-*Geranium cicutarium* L.

**ERODIUM ROMANUM** (Burm. F.) Willd. Plant usually perennial, pubescent and sometimes canescent and silvery. Stems and leaves u.s. Petals usually twice or thrice as long as the sepals. Beak of rostrum 3 or 4 cm. long. (P) Same distribution as the preceding species. Must be very rare, as it is only mentioned

in Webb's Herbarium. This species is often considered as a variety of the preceding-*Geranium Romanum* Burm. F.

## TRIBE II-OXALIDEAE.

Carpels do not separate from the axis of the gynoecium. Capsule of 5 undivided cells.

## OXALIS L.

Herbs, usually perennial with a rhizome, or bulbils or bulbs, or underground stolons, and usually ternate leaves on long petioles. Calyx of 5 sepals, sometimes united at the base. Corolla of 5 petals, usually slightly connivent at the base, contorted in the bud. Stamens 10 with filaments often monadelphous at the base. Ovary of 5 cells with 1 or more ovules in each. Styles 5, free or united at the base. Capsule of 3-loculi, with one or more seeds, with apical and dorsal dehiscence; seeds enclosed in a fleshy and elastic aril. Species about 220, with a few exceptions natives of South Africa, Madagascar, and Tropical and South America.

*OXALIS CERNUA* Thunb. Stems wanting, with many solid tubers and bulbils and occasionally with long white fleshy rhizomes. Plant glabrous, with ordinarily thin rhizomes having one or more tubers or bulbils of various sizes. Leaves ternate, on a long and fleshy petiole, with obcordate leaflets, almost bilobed at the apex, but otherwise entire, usually with many small brown or reddish dots on the upper surface. Stipules connate with the base of the petiole, forming a fleshy sheath. Peduncles long and fleshy, radical, with 6-12 flowers, drooping in the bud. Sepals with 2 callosities at the apex. Petal 5 times as long as the calyx, yellow. (P) native of the Cape of Good Hope. December-April. Naturalised since 1811. An invading weed, and very common everywhere in Malta, Gozo and Comino. Sometimes used as green fodder for cattle and other animals. A form with double flowered flowers, deep yellow, tinged reddish or brown (var. *pleniflora* Ces.) is frequently met with in certain localities, especially on field walls and at Puales. This double-flowered form produces no seed; and even the typical single-flowered plant very rarely seeds at all, although occasionally a mature capsule is found very late in the season, in April or May, the plant reproducing itself by its many small tubers or bulbils. Their dissemination is greatly assisted by the practice of piling up the weed on field walls, where in the process of drying a vast quantity of minute tubers are produced on the roots and rhizomes, which are carried away by the wind for considerable distances-*Oxalis lybica* Viv.- *O. Burmannii* Jacq. The species is now broadly naturalised all over the Mediterranean region. E. Wood Sorrel or Cape Sorrel. M. Haxixa Inglisa or Inglisa.

*OXALIS VIOLACEA* L., and *O. humilis* Thumb. Natives of South Africa, and *O. braziliensis* have naturalised themselves in certain gardens, but are far from having the same invading character.

*OXALIS CORNICULATA* L. Plant more or less pubescent. Stems more or less prostrate and rooting, especially the lateral branches; often with underground

stolons. Leaves alternate, ternate, with 3 obcordate leaflets, otherwise entire. Stems and petioles not fleshy. Peduncles axillary, with 2 or more flowers, erect even in the bud. Petals yellow, twice as long as the calyx. Capsules with many-seeded loculi. (A), (B) or (P) central and Southern Europe, Africa, Central and Southern Asia, North and Central America, Chili, Australia, New Zealand etc. March-November. Frequent in Malta and Gozo, in gardens, on irrigated ground, along roads etc.-*O. villosa* M. B.

Var. *purpurea* Parl. Leaves and stems dark red. Frequent with the species, especially in flower-pots and garden walks. Both the species and the variety are sometimes found in a form (*ascendens* Moris.-*O. Navieri* Jord.) with erect stems, branched from the base, not rooting, and without underground stolons.

## LINACEAE.

Herbs or small shrubs, with entire mostly alternate and oblong or lanceolate leaves, without stipules. Flowers actinomorphic in loose terminal corymbs, or axillary. Sepals entire, 5, rarely 4, contorted in the bud. Stamens equal in number of the petals, with abortive staminodes alternating between them; rarely 10 stamens. Styles usually 5, with capitate stigmas. Capsule separating into as many carpels as there are cells, without any central axis; each carpel divided longitudinally by a false septum with one seed in each partition. Seeds without albumen. Genera 8, with about 150 species broadly distributed, especially in the northern hemisphere.

### LINUM (Tourn.) L.

Sepals 5 entire. Petals 5, sometimes slightly connivent at the base. Stamens 5, with 5 very small intermediary staminodes, reduced to a squamous or bristle-like accrescence, all connivent at the base. Ovary 5-celled, each more or less divided longitudinally by a false septum, with one ovule in each partition. Seeds compressed. Species about 90, mostly natives of the temperate and subtropical regions of the northern hemisphere.

**LINUM DECUMBENS** Desf. Plant glabrous and glaucous. Stems prostrate or ascending (1-4 dm.) Leaves alternate, linear, acute or acuminate, entire, with 3 longitudinal nerves. Flowers pink, small, axillary, forming very loose terminal corymbs. Sepals oval or ovate-lanceolate, terminating in a long point. Capsule globose, acuminate, subequal to the calyx. (A) South Italy, Sicily, North Africa. April-May. In Malta, at Ghain Zeituna near Melleha, not far from the sea shore.

**LINUM USITATISSIMUM** L. Plant glabrous, often glaucous; stems erect or occasionally prostrate or ascending. (1-10 dm.) leaves alternate, obtuse-lanceolate, the upper linear, acute, entire, usually with 3 longitudinal nerves. Flowers blue, terminal or axillary, forming a loose leafy corymb. Sepals oval or oblong acuminate. Petals 2-3 times the length of the calyx with a short claw. Capsule globose acuminate, longer than the calyx. (A), (B) or (P) South Europe,

Great Britain, Asia Minor, North Africa, Caucasus, Canaries, Madeira. The typical form is not found in the Maltese Islands.

Var. *angustifolium* Huds. Plant annual or perennial, leaves linear or linear lanceolate, acuminate, with indistinct lateral nerves: flowers light blue: capsule smaller than that in the typical form; peduncles much longer than the calyx.-*Linum tenuifolium* var. L- I. *Pyrenaicum* Pourr.-L. *decumbens* Moris non Desf. Waste lands and sandy sea-shore. Rare. Malta, at Ramla tal Kordin, Marfa, and at Selmun. E. Pale-flowered Flax. I. *Lino selvatico*. M. *Chittien salvagg*.

**LINUM GALLICUM L.** Plant annual, glabrous, light green. Stems and leaves flexible. Leaves alternate, linear, acute or acuminate. Stem erect or ascending. Flowers in loose elongated corymbs; peduncles about as long as the calyx. Sepals lanceolate-acuminate with marginal glands. Petals twice as long as the calyx, yellow, or often white (*albiflorum* Parl.) Capsule shorter than the calyx, globose-depressed, shortly acuminate. (A) South Europe, North Africa, West Asia, Caucasus, Abyssinia, Canaries, Madeira. March-May. Frequent in valleys, rocky ground and exposed arid wastes, in Malta, Gozo, Comino, Cominotto.-*Linum aureum* W. & K.

**LINUM STRICTUM L.** Plant annual, glabrous, glaucous. Stems erect or ascending, usually branched, rigid. Leaves entire, scabrous, with 2 lateral indistinct nerves, very narrow, linear, acuminate, alternate. Flowers forming a dense corymb, on rigid peduncles shorter than the calyx. Sepals lanceolate, acuminate, with scabrous margins. Petals yellow, slightly longer than the calyx, or slightly shorter. Capsule globose, shortly acuminate, shorter than the calyx. (A) Distribution almost u.s. March-May. Frequent u.s. in Malta, Gozo, Comino and Cominotto. The local plants belong mostly to the form *spicatum* Lam.-L. *inaequale* Presl., with flowers more or less racemose, and sometimes to the form *capitatum* Guss., with flowers collected in a loose cyme or head.

## ZYGOPHYLLACEAE.

Herbs, shrubs or trees, with stems often jointed at the nodes. Leaves opposite or alternate, stipulate, pinnate or imparipinnate, with leaflets sessile and entire, with geminate stipules at the base of the petiole, persistent or spinescent. Flowers actinomorphic or zygomorphic, hermaphrodite, axillary, and often solitary. Sepals 5-4, hypogynous free, rarely connate at the base. Petals 5-4, free, rarely wanting, Stamens usually double the number of petals, inserted on a convex or annular disk or gynophore, and usually with a scale on their inside. Ovary free, sessile or shortly stipitate, furrowed, angular, or winged, with several cells. Style simple, sometimes almost wanting. Fruit coriaceous, or separating into cocci, or a loculicidal capsule. Seeds usually solitary in each cell, with a green embryo, and generally with a cartilaginous albumen.

The family includes 21 genera, and about 250 species, natives mostly of the warm regions in the northern hemisphere.



The raspings of the hard greenish brown wood of *Guaiacum officinale* of the West Indies are used as depurative and sudorific. The very foetid *Zygophyllum Fabago* of Western Asia and Arabia is used as anti-syphilitic and vermifuge; its flower buds are pickled in vinegar and used as capers.

#### FAGONIA (Tourn.) L.

Annual or perennial herbs. Calyx of 5 sepals; corolla of 5 petals. Stamens 10, filaments free and without glands at the base. Ovary of 5 cells, each with 2 ovules; style 1, stigma 5-lobed. Fruit a capsule, spineless, breaking into 5 dehiscent carpels, each containing only one seed. Species about 18, natives of the Mediterranean region, South-West Africa, California and Chili.

*FAGONIA CRETICA* L. An annual glabrous plant, deep green in colour. Stem prostrate or decumbent, very branched, with jointed nodes (3-6 dm.). Leaves opposed, trifoliate, with a winged petiole, the leaflets being entire, lanceolate, acute. Stipules awl-shaped and spinescent. Flowers axillary and solitary, with hairy peduncles. Flowers pink or violet-pink or white; petals roundish, with a marked claw. Capsule hairy. (A) Spain, Portugal, Cyprus, Candia, Sicily, North and Tropical Asia, the Canaries, South America and Mexico March-May. *Malta*, rare, at Gniena on a hillside close to the sea, and according to Delicata also at Fomm ir-Rih.

#### TRIBULUS (Tourn.) L.

Herbs usually with prostrate stems. Calyx of 5 sepals, corolla of 5 petals. Stamens 10, 5 of which with a gland at the base. Ovary 5-celled, each with 3-4 ovules. Stigma sessile and single. Fruit a capsule, breaking into 5 indehiscent carpels, of bony texture, tubercled and spiny, each carpel having 2 or 3 in each carpel. Species about 12, distributed in most warm regions.

*TRIBULUS TERRESTER* L. An annual pubescent plant, with long prostrate, flexuose and much branched stem (1-12 dm.) Leaves opposed, sometimes alternate, paripinnate, with 4-8 pairs of oblong, acute, entire leaflets almost sessile. Stipules 2, lanceolate acute. Flowers axillary and solitary, on a peduncle shorter than the leaves. Flowers yellow, with obovate-oblong petals. (A) Mediterranean region as far as Tibet, throughout Africa, Central Europe; naturalised in Australia, and South America. June-November. In stony and sandy places. *Malta*, Floriana near Piazza Miratore, Marsa, Calcara, Birchircara, along the railway from Birchircara to San Salvatore, Attard etc. Gozo, at Ramla, where it is very common on the sandy hill on the right side of the valley. -*Tribulus Gussonei* tod. E. Land Caltrops. I. Tribolo, Caciarello. M. Ghatba, Salib l'art.

#### RUTACEAE.

Perennial herbs, often suffrutescent. Leaves alternate, exstipulate, simple but rarely entire, generally dotted with oil glands. Flowers actinomorphic, hermaphrodite, in terminal corymbs or racemes, yellow or white. Calyx persistent, 4 to 5-parted. Corolla of 4-5 petals inserted at the base of a

gynophore. Both calyx and corolla with imbricate aestivation. Stamens inserted with the petals, and generally twice the number of petals, with free filaments, or hardly monodelphous at the base. Ovary 2 to 5-celled with the same number of lobes, inserted on a dilated or disk-like gynophore. Styles generally connate into one, rarely distinct. Ovules 3 or more in each cell, inserted in two series at the inner angle of each loculus. Fruit a capsule, with various dehiscence, rarely fleshy. Seeds with fleshy albumen.

The Rutaceae, to which the Aurantiaceae are very closely allied, include 82 genera and about 850 species, distributed in all temperate regions, but chiefly in South Africa and Australia.

*Ruta montana*, a native of Spain, is highly acrid and poisonous. *Ruta graveolens* and *R. chalepensis* of South Europe are used as sudorific, vermifuge and emmenagogue, and are used bruised with olive oil as a vulnerary for contusions and sprains.

#### RUTA (Tourn.) L.

Calyx 4-5 cleft. Corolla of 4-5 equal petals, mostly concave. Stamens 8 to 10, free or almost free. Ovary 4-5 lobed, with 4-5 cells. Style 1; stigma entire. Capsule 4-5 lobed, with 4-5 cells, each with 2 or more seeds, dehiscing apically and internally. Species about 40, natives of the Mediterranean region, and Central Asia as far as Siberia.

**RUTA CHALEPENSIS L.** A suffrutescent perennial, emitting from all its parts a very foetid odour, when bruised. Stem erect, and branched from the base. Leaves alternate, all 2-3 pinnatifid, deep green or bluish green, and glaucous with ovate oblong or lanceolate linear segments, dotted with pellucid glands. Flowers yellow, in terminal corymbose cymes; the central flowers having 5 petals, and the outer only 4; all petals are lacinate or fringed along the margin. Ovary with 4-5 lobes and cells, each containing 5-12 ovules. Capsule with 4-5 acuminate lobes. (P) Mediterranean region, Abyssinia, Madeira, Canaries; naturalised in North America.

Var. *bracteosa* D.C. Leaves with oblong or obovate-oblong segments. Bracts wider than the branches. Corolla about 5 mm. in diameter; petals with lacinae not more than half the width of the petal.- *Ruta angustifolia* Pers. March-May, and even later. Frequent on uncultivated ground and in rocky and arid localities, in *Malta*, *Gozo*, *Comino* and *Cominotto*. E. Rue. I. *Ruta sfrangiata*. M. Feigel.

The larva of the beautiful butterfly *Papilio Machaon* greedily feeds on the leaves of this plant, which is also often cultivated to have a handy remedy for contusions, sprains and bruises.

#### Aurantiaceae.

Trees and shrubs mostly evergreen, and usually glabrous; having in all their aerial parts glands with a volatile oil. Leaves persistent, alternate, exstipulate and compound, or one-foliolate with the leaf or leaflet jointed at the end of a

winged petiole, often with one spinous or spinescent lateral axillary bud. Flowers actinomorphic, hermaphrodite, terminal and solitary, or in small racemes or corymbs. Calyx short, persistent 4-5 toothed, sometimes 3-toothed. Corolla hypogynous, usually of 5 petals, free or slightly coherent at the base, deciduous. Stamens 2, 3 or more times the number of petals, inserted at the base of the gynophore or disk, with filaments free or monodelphous or polyadelphous. Ovary on a stipitate or disk-like gynophore, 5-many-celled, with a simple thick style and capitate stigma. Fruit a berry, dry or fleshy, with a thick rind, with 5 or more cells, each containing one or more seeds, embedded in a mass of vesiculate cells, called a hesperidium. Seeds exalbuminose, with thick greenish cotyledons, and sometimes polyembryonic.

The important genus *Citrus*, includes the Seville Orange, the common Orange, the Lemon, the Lime, the bergamot, the Mandarin, the Citron etc., which are either delicious fruits, or valuable medicinal or household fruits extensively used as condiment. The rind of the Seville-orange is aromatic and is used as a bitter tonic and stomachic, and a condiment. Orange-flower water distilled chiefly from Seville-orange flowers is a household stomachic and antiscorbutic always kept at hand. The rind of the Bergamot, the Lemon, the Mandarin, and particularly that of the Sweet Lime and Melarosa are often used for flavouring and are bitter and tonic. The Orange and the Mandarin are delicious table fruits, universally appreciated, and available for a great part of the year when few fresh fruits are obtainable. Their juice and especially that of the Lemon and Lime contains much citric acid and is very refreshing and antiuric, besides containing perhaps the largest percentage of vitamins known to exist in any fresh vegetable or animal food. The juice of the average lemon contains about 20 grains of free citric acid. The volatile oils expressed from the rind of the Lemon, the Orange, the Bergamot and the Mandarin-orange are highly prized in perfumery and for flavouring. A lemon cross-cut in four pieces, and kept overnight in some water with sugar, and then boiled and taken as a decoction in the morning is a popular remedy often resorted to in Mediterranean for Undulant fever.

### CITRUS L.

Evergreen trees or shrubs, with alternate unifoliate or trifoliate leaves. Calyx 3-5 toothed. Corolla with 4-8 petals, deciduous. Stamens numerous, polyadelphous. Ovary of 5-12 cells, each with 4-8 ovules in 2 series. Fruit is a hesperidium, indehiscent, with 5-12 loculi, each with few seeds, with a juicy pulp made of elongated cells or utricles. Rind leathery, externally yellow, orange or red, dotted with oil-glands. Species 5, natives of India, and anciently cultivated in China and CochinChina.

**CITRUS MEDICA L.** An evergreen tree or shrub (2-5 m.) with alternate unifoliate leaves, with a more or less winged petiole, coriaceous, dotted with oil glands, emitting a pleasant odour when crushed, oval or oblong, acute or obtuse, crenate or entire. Young shoots and tender leaves coloured reddish or brown violet. Flowers more often in corymbs, terminal or lateral; petals externally more or less coloured reddish; many flowers having an abortive pistil. Fruit more or less oblong, rarely roundish, usually with a yellow rind, and with a prominent navel.

(S) Native of India, and extensively cultivated in many forms; all agreeing in having a thick and rather solid rind, more or less rugose, usually of a yellow or deep yellow colour, but occasionally orange in plants producing smaller and roundish fruits and flowers deep dark red on the outside. The juice is always sub-acid. E. Citron. I. Cedro, Cedrato. M Citrat, Xcomb.

Var. Limon L. Rind thinner and softer, smooth or rugose, with glands containing a more pungent oil. The colour is very generally yellow, light yellow or deep yellow, very rarely almost orange. Seeds smother and harder; juice very acid, but rarely devoid of all acidity and sweet. Flowers less reddish on the outside and rarely produced in corymbs on older wood. Cultivated in many forms.-Citrus Limonum Risso. E. Lemon. I. Limone. M. Lumi.

CITRUS AURANTIUM L. Flowers white inside and outside, usually solitary or in terminal cymes, never produced in corymbs on older wood: all flowers hermaphrodite. Young shoots and tender leaves light green. Fruit usually globose or roundish, never with a prominent navel, and usually with an orange-coloured rind, thin, soft and usually very smooth. The rest u.s. (S) native of India, and extensively cultivated in many varieties and forms in most tropical and subtropical countries.

Var. communis Mihi.-C. dulcis Pers. Leafstalk hardly winged, or sometimes winged. Fruit globose-depressed. Rind orange. Pulp abundant, sweet or pleasantly acidulous e. Common Orange. I. Arancio, Arancio dolce, Portogallo. M. Laringa, Laringa tal ichel. Cultivated in many commercial forms, sometimes with a blood-red rind, and pulp splashed red or of oval or oblong form, or with a depressed large navel, or seedless, etc.

Var. nobilis Lour.-Citrus nobilis Lour.-C. deliciosa Ten. Fruit globose, flattened above or below, or depressed and concave at the base. Rind thin, with large glands, orange, becoming almost separated from the pulp at full maturity. Flowers smaller; leaves smaller and more pointed, highly aromatic. Originated in South China, now extensively cultivated in various forms. E. Mandarine-orange. I. Mandarino. M. Mandurina.

Var. Bigaradia Lois.-Citrus Bigaradia Lois.-C. amara Lk. Fruit globose or globose-depressed, with a thick deep orange rind, rather rough, very bitter and aromatic. Pulp bitter and acid. Petiole more or less broadly winged. Flowers, leaves, and young fruit very aromatic. Cultivated in several forms, and often found self-sown in gardens. E. Bitter Orange, Seville Orange. I. Arancio forte, Melangolo. M. Laringa karsa, Zupperit.

Var. Bergamia Risso.- Citrus Bergamia Risso. Fruit globose or globose-depressed or pyriform, with a persistent style but usually without a prominent navel. Rind rather thin, very bitter and very aromatic, pale yellow at maturity. The form melarosa, is smaller in all its parts, the fruit being globose-depressed, small, with a large but not prominent navel, pale yellow to deep yellow at maturity. Pulp subacid, white, very bitter. Cultivated for the highly aromatic qualities of its rind. E. Bergamost. I. Berganotto, M. Bergamotta.

Var. Limetta Risso.- *Citrus Limetta* risso. Fruit round or oblong, with an obtuse protuberance or navel at the apex, with a yellow rind, usually very aromatic. The pulp is greenish and may be extremely acid and slightly bitterish, or even very sweet and devoid of all acidity. Leaves aromatic, lemon-like, but the young shoots and leaves are green. Flowers white, sometimes very slightly tinged reddish on the outside, E. Lime. I. Limone-bergamotto, Pomo d'Adamo, M. Lumicell (sweet), Lumi ta bla zerrigha (acid).

CITRUS DECUMANA L. Fruit very large, round or oval, with a thick, very tough and smooth rind, light yellow at maturity, almost devoid of aroma, pulp tough and leathery, greenish or white streaked red, bitterish, with large, pure white, or greenish on the outside; leaves leathery with a winged petiole.- *Citrus Aurantium* var. *grandis* L.- *C. Aurantium* var. *decumanum* L. Cultivated for ornament. E. Shaddock. Grape-fruit. I. Arancio maggiore. M. Xaddock, Laring ta Olanda, Laring tar-Rjus.

NOTE:- In all probability the cultivation of the Seville Orange and of the lemon, in the Maltese Islands, dates as far back as the occupation of the Arabs, towards the close of the 9<sup>th</sup> Century. The Common Orange must have been introduced somewhat later and the Egg-orange is probably a sport of this orange introduced from Portugal during the rule of the Order of St. John. The Malta Blood-orange is an old variety of local origin, and is described and figured as a well known variety of long standing in Risso's work "The Natural History of the Orange Trees" published in 1747. The Egg-blood orange is a bud-sport of the Egg-orange and is known to have originated on a tree of the Egg-orange in a small orange-grove at Casal Balzan, towards 1850.

## SIMARUBACEAE.

Trees or shrubs, frequently with a bitter bark. Leaves alternate rarely opposed, generally pinnate, sometimes 1-3 foliolate or even simple, rarely stipulate. Flowers actinomorphic, diclinous or polygamous, usually axillary in racemes or panicles. Calyx 3-5 cleft. Petals hypogynous, 3-5, rarely wanting, free, or very rarely connivent at the base, with various aestivation. Stamens double the number of petals, or equal and alternate, rarely more than 10. Filaments free inserted at the base of an annular or cupuliform disk. Carpels 2-5, rarely solitary, free or variously united. Styles 2-5, with stigma free or coherent. Ovules usually 1, rarely 2-5 or more in each carpel. Fruit various.

The family includes 30 genera, and about 112 species natives of warm regions.

The wood of *Quassia amara* and the bark of *Simaruba guianensis* and *S. amara* are well-known bitter tonics devoid of astringency. The inner bark of *Brucea antidysenterica* of Abyssinia is valued in intermittent fevers and dysentery.

## AILANTUS Desf. Em.

Flowers polygamous. Calyx 5-cleft. Corolla of 5 petals. Stamens 10 in hermaphrodite flowers, and only 2-3 in male flowers. Ovary 2-5 cleft, with compressed lobes, each cell with one ovule. Styles 2-5 connate in one, with 2-5 plumose stigmas. Fruit consisting of 2-5 samaras, one-seeded, with an oblong-linear wing. Species 3, natives of India and China.

*AILANTUS GLANDULOSA* Desf. A large deciduous tree (3-15 m.) Leaves very large, alternate, imparipinnate, with 7-12 pairs of sessile leaflets, obliquely oblong and acuminate, entire except at the base which is roughly toothed, glabrous, but with ciliated margin. Flowers small, greenish, in large terminal panicles, with petals hairy at the base. (S) China and Japan, naturalised elsewhere. April-May. Introduced through Italy, and extensively cultivated for avenues. Naturalised in old cemeteries, gardens, ditches, fortifications etc. in Malta, Gozo and Comino. E. Japanese Varnish-tree, False Shumack. I. Ailanto. M. Xumach.

## MELIACEAE.

Trees or small shrubs, with alternate exstipulate leaves, pinnate or rarely simple, entire or toothed. Flowers actinomorphic, usually hermaphrodite, in terminal or axillary panicles. Calyx small 4-5 fid. Petals hypogynous, 4-5, sometimes 3-7, distinct or partly coherent. Stamens usually twice the number of petals, inserted with them, filaments monodelphic forming a tube. Ovary surrounded by a disk at the base, with 2 or more cells, each with 1 or several ovules. Fruit capsule, or a drupe, or a berry.

The family includes 37 genera and about 270 species, natives of tropical and subtropical regions, chiefly in Asia and America.

*Melia Azedarach* is bitter purgative and vermifuge, but poisonous in large dose. The bark of species of *Khaya* and *Swietenia* is bitter and febrifuge. The wood of *Swietenia Mahogani* is the Spanish or Honduras Mahogany, that of *S. chloroxylon* is one of the Satin-woods, and that of *Khaya africana* is the African Mahogany.

## MELIA L.

Trees or shrubs, with alternate bipinnate leaves, and flowers in large axillary panicles. Calyx 5-parted. Corolla of 5 petals. Stamens monodelphous forming a long cylindrical tube expanded at the top and including the anthers. Ovary 5-celled, each cell 2-ovuled. Drupe somewhat fleshy, with a hard stone of 1-5 cells, each with not more than one seed. Species about 5, natives of tropical Asia and Australia.

*MELIA AZEDARACH* L. A tree with a tall stem branched above (3-8 m.) Leaves alternate, deciduous in this country, rosulate at the end of the twigs, bi-pinnate, with sessile leaflets, obliquely oval, acuminate, deeply toothed and glabrous. Flowers sweet-scented. In large axillary branched panicles. Petals lilac. Drupe

roundish, persistent on the tree and becoming almost dry, (S) Native of the Himalayan region. March-May. Cultivated for avenues, and often naturalised, as at Addolorata Cemetery, Boschetto, ditches and fortifications of Valletta and Floriana, etc.-*Melia sempernirens* Sweet.-*M. orientalis* M. Roem.-*M. japonica* G. Don. E. India Lilac. I. Albero da rosari. M. Lila, Sagra tat-toscu.

## POLUGALACEAE.

Glabrous herbs or undershrubs, with simple entire alternate leaves, rarely opposite. Flowers zygomorphic, hermaphrodite, solitary or in spikes or racemes, terminal or axillary, with bracteate jointed pedicels. Calyx of 5 sepals, imbricate, 2 inner larger and often petaloid. Corolla of 3-5 petals, hypogynous, the two lateral free, concave or galeate forming a keel: sometimes gamopetalous, or wanting. Sometimes the 2 upper are equal to the lateral enveloping the keel. Stamens generally 8, inserted on the receptacle, with filaments usually monodelphous; anthers basifix. Ovary free, with 2 anteroposterior cells, sometimes 1-5 celled. Style terminal curved, dilated at the top, entire or finishing in 2-4 lobes. Fruit usually a loculicidal or indehiscent capsule, sometimes a drupe or samara. Includes 11 genera, and about 680 species natives of warm and temperate regions, mostly in America.

The Polyglaceae contain bitter principles which give them tonic and astringent qualities. The root of *Polygala Senega* is used as an expectorant. The root of *Krameria triandra* (*Ratania*) contains much tannic acid and is strongly astringent.

### POLYGALA (Tourn.) L.

Calyx persistent, of 5 sepals, of which the 2 inner or laterals (wings) are petaloid and larger. Corolla of 3 lobes, of which the anterior or median is keeled, terminating in a fringed crest: corolla inserted on an intrastaminal complete ring. Stamens 8, didelphous, their filaments united in two bundles of 4 filaments. Anthers unilocular, dehiscent by an apical slit. Ovary 2-locular, with one ovule in each cell. Style 1, stigma made of 2 unequal lobes. Capsule compressed laterally, with winged margin, 2-celled, containing each one hairy seed furnished with a minute trilobed aril. Species about 430, distributed all over the world, mostly in America.

**POLYGALA MONSPELIACA L.** An annual plant, glabrous or somewhat hairy, with erect stems, simple or branched (1-4 dm.). Leaves lanceolate or linear-lanceolate, entire, acute. Flowers in terminal racemes, with bracts subequal to the pedicels. Wings whitish, 6-7 mm. Long, with a longitudinal median green band. Corolla white. Ovary on a very short pedicel, the anterior lobe of the stigma being much larger than the other. Capsule almost sessile. Seeds with a minute aril. (A) Mediterranean region. March-May. Frequent or common on open waste ground, slopes of hills etc., in Malta and Gozo.-*P. glumacea* S. et S. - *P. straminea* Presl.-*P. sicala* Tin. E. Milk-wort.

*Polygala myrtifolia* L.-*P. grandiflora* Lodd., native of South Africa, often cultivated for ornament is met with here and there self-sown.

## ORD. SAPINDINAE.

### ANACARDIACEAE.

Trees, shrubs and undershrubs with resinous ducts situated in the phloem, in the nerves of the leaves, etc. Leaves simple or compound, alternate and sometimes opposed, without stipules. Flowers small, greenish or yellowish, variously grouped in terminal or axillary cymes, racemes or panicles, hermaphrodite, or dioecious, or polygamous, actinomorphic. Calyx gamosepalous, with 5 segments or lobes. Corolla of 5 petals or wanting. Stamens 5, inserted with the petals or on the calyx. Ovary 1-locular and 1-ovuled, with 1 or 3 styles. Fruit a drupe, fleshy or dry. This family includes 58 genera and about 430 species, mostly natives of tropical and intertropical regions of both hemispheres, only a few inhabiting temperate regions. They are all more or less resinous, even the fleshy drupe being often charged with resinous matter, more or less aromatic.

The Anacardiaceae possess a gummy or milky resinous juice, sometimes deleterious. Thus *Rhus venenata* and *R. Toxicodendron*, both of North America and highly poisonous. Other species of Japan, China and Burmah yield valuable varnishes. *Rhus Cotinus* of South Europe yields an orange-yellow dye. *Melanorrhoea usitatissima* of the East yields an indelible black dye. The Mango, *Mangifera indica*, native of the East Indies is one of the best tropical fruits. The fruits of *Spondias purpurea* and *S. dulcis* of the West Indies are very wholesome and refreshing. *Schinus Molle* and *S. terebinthifolia*, False-peppers, natives of subtropical America are frequently cultivated for ornament for their elegant balsamic foliage; they produce bunches of dry drupes which in other countries are used for adulterating black pepper. *Rhus Coriaria* a rare native plant, is largely cultivated in Sicily, its pulverized leaves being a valuable tanning material. The well-known Pistachio-nut is the produce of *Pistacia vera* native of Persia and Syria, extensively cultivated in Sicily, and occasionally met with in our gardens. *P. atlantica* native of North Africa from Morocco to Tripoli yields *amastic* similar to that obtained in Scio from *P. Lentiscus*, and like *P. Terebinthus* is an excellent stock for grafting *P. vera*.

### PISTACIA L.

Small trees or shrubs with alternate, compound, imparipinnate or pinnate leaves. Flowers dioecious, small, in terminal or lateral racemes, compound racemes or panicles. The male flowers have a 5-lobed calyx, without corolla, with the 5 stamens inserted on the calyx, with very short filaments connivent at the base. The female flowers have also a 5-lobed calyx, without corolla. The ovary is free, 1-locular, 1-ovulate, with a very short style terminating in 3 arched stigmas. Fruit a drupe, almost dry. Includes 5 species natives of the Mediterranean region, Asia Minor and Persia, 1 from Eastern Asia, and 1 Mexican.



**PISTACIA TEREBINTHUS L.** A small deciduous tree or shrub with imparipinnate, alternate, glabrous leaves, having an angular, pubescent petiole. Leaflets rather coriaceous, ovate-oblong, oblique at the base, mucronate at the apex, entire; usually narrower in male trees. Inflorescence axillary, arising from the axils on twigs of the previous year's growth: flowers brownish green, in compound and racemes or panicles. Fruit an ovoid compressed apiculate drupe, of a reddish or bluish-red colour, with a resinous sticky juice (S) Mediterranean region. April-July. Very rare- isolated specimens exist at Boschetto; cultivated or self-sown elsewhere. E. Terebinth. I. Terebinto, Scornabecco, Spaccasassi. M. Scornabech Used as stock for *Pistacia vera*; the male flowers are used for the pollination of *Pistacia vera*; hence hybrids of *Pistacia Vera Terebinthus* are occasionally met with in gardens. Pistachio-nuts obtained by pollination with the Terebinth often produce trees having the foliage and appearance of *P. vera*, but the fruit are much smaller, roundish, with a compressed nutlet, which however has a core or almond of the same colour and flavour as the pistachio-nut. The long horn-like galls at the end of the twigs, are due to an Aphid *Pemphigus cornicularius* Pass.

**PISTACIA LENTISCUS L.** An evergreen tree or small shrub, with many long branches more or less tortuous. Leaves usually paripinnate, persistent, with the petiole winged between the leaflets, dark green, glabrous, generally with 3 to 5 pairs of leaflets, which are coriaceous, ovate-oblong, or oblong lanceolate, entire, obtuse or emarginate, mucronate, with a strong resinous odour. Flowers brownish yellow, in dense spike-like racemes, arising from the axils of leafy-twigs. Drupes small, ovoid or subglobose, obliquely apiculate, red and afterwards black (S) Mediterranean region, and Somalia. January-April. In ravines and valleys in Malta and Gozo. Frequent at Boschetto, Bahria, Ta Baldu, Wied babu, Gnien il Cbir, Wied Gherzuma, Wied il Ghasel, Wied Encita etc (Malta), and at Imgiar-ix-Xini, Chambray and Xlendi (Gozo). The margin of the leaves is often affected with the galls of *Aploneura Lentisci* Pass. E. Lentisk. I. Lentisco, Sondro. M. Deru.

#### RHUS (Tourn.) L.

Trees and shrubs, with simple or compound leaves, usually alternate. Flowers hermaphrodite or dioecious. Calyx with 5 lobes. Petals 5, inserted on the receptacle; stamens 5 inserted with the petals, on long free filaments. There is an infrastaminal disk. Ovary superior, free, 1-locular with one ovule. Styles 3, free or hardly united at the base. Fruit a dry compressed drupe. Species about 200, mostly natives of the northern hemisphere, and of Tropical and South Africa.

**RHUS CORIARIA L.** An evergreen shrub with coriaceous leaves, with branches slightly spinous (1-4 m). Leaves imparipinnate, persistent, more or less hairy along the nerves on the lower surface, and slightly hairy on the upper surface. Petiole hairy, winged between the leaflets, with 5-7 pairs of roundish or oblong, obtuse or subacute leaflets, crenate or serrated, rarely entire. Flowers yellowish-white, in dense panicles, hermaphrodite, on very short pedicels. Drupes subglobose, hirsute dark purple. (S) Mediterranean region, Caucasus, Canary

Islands and Madeira May-June. Rare, at Wied Znuber (Malta), on rocky ground and along the walls of fields. E. Sumach. I. Sommaco. M. Sumac tal conza.

## ORD. FRANGULINAE.

### RHAMNACEAE.

Trees, shrubs and undershrubs, with entire, alternate, or opposed leaves, furnished with herbaceous or spinescent stipules. Flowers actinomorphic, greenish, small and inconspicuous, in the axils of the leaves singly or in short racemes; usually hermaphrodite, sometimes monoecious. Calyx gamosepalous with 4-5 lobes. Corolla of 4-5 petals, rarely wanting. Stamens 4-5 inserted on the petals. There is an intrastaminal disk, and the ovary has 1-4 loculi, each with 1-2 ovules. Fruit a berry, or more often a fleshy or dry drupe. The family includes 45 genera, and about 450 species spread all over the world.

Several species of *Rhamnus* such as *Rh. Cathartica*, *Rh. Frangula*. *Rh. Purshianus*, *Rh. Alaternus*, *Rh. Saxatilis* etc. possess drastic properties in their berries or in their bark. Green and yellow colouring matter is also obtained from the berries of *Rh. Cathartica* and *Rh. Alaternus*. *Zizyphus sativa* and *S. Lorus* produce sweet fleshy drupes which are edible, emollient and pectoral. 1 *Paliurus*, 2 *Zizyphus*, 3 *rhamnus*.

### PALIURUS (Tourn.) L.

Prickly deciduous shrubs. Calyx conical with 5-6 lobes. Petals 5-6 small, alternate with the lobes of the calyx. Ovary sunk in the intrastaminal disk, with 3 loculi each with 1 ovule. Fruit a dry spongy drupe, furnished all around it with a broad membraneous wing-like margin, with 3 loculi each with 1 seed. Specie 2, native of s. Europe, N. Africa, Western Central and Eastern Asia.

**PALIURUS SPINA-CHRISTI** Mill. A small erect shrub, much branched, throwing up many suckers from the base (1-2' h.). Leaves alternate, oval or ovate-oblong, sometimes cordate, obtuse or acute, with a rather short petiole, entire or crenate, glabrous, with 3-5 longitudinal nerves, deciduous. Stipules spiny, unequal, the long being straight, and the shorter curved. Flowers hermaphrodite, in axillary corymbose cymes (S) April-June. South Europe, Caucasus and Western Asia. Very rare: only found in isolated specimens in fissures of the rock at Xlendi (Gozo) – *Rhamnus Paliurus* L.-*Paliurus australis* Gaertn.-*P. aculeatus* Lam.-*Zizyphus Paliurus* W. It is supposed that the crown of thorns of Jesus Christ was made of the branches of this shrub. E. Christ's Thorn. I. Soldino, Marruca, Spino-gatto m Xeuk tal Curuna.

### ZIZYPHUS (Tourn.) Juss.

Spiny trees and shrubs mostly with deciduous foliage. Calyx conical or funnel-shaped, 5-lobed. Petals 5, minute, alternate with the lobes of the calyx. Stamens 5, inserted on the petals. Ovary sunk in the intrastaminal disk with 2

loculi, each with one ovule. Styles 2. Fruit a drupe, olive-shaped or roundish, with one stone consisting of one loculus, rarely two loculi, with one seed. Species about 40, natives mostly of India and Malasia, some of tropical America and a few spread over the Mediterranean region, Eastern Asia, Tropical and south Africa and Australia.

#### ZIZYPHUS SATIVA Gaertn.

A shrub or tree about 4 m high, glabrous. Leaves alternate, ovate-oblong, of a shining green colour, finely toothed or glandular along the margin, with a short petiole and with 3 nerves converging at the apex deciduous. Stipules spinescent, unequal, the longer being straight and outspreading, and the shorter reflexed. Flowers in small axillary cymes subequal to the petiole. Petals whitish, concave, shorter than the calyx. Fruit a reddish oblong drupe with a coriaceous rind. (S) According to A. De Candolle native of North China. Cultivated and naturalised in Japan, India, Western Asia and the Mediterranean region. May-June. Naturalised in many old gardens and valleys in Malta and Gozo, but reproduces itself mostly by suckers. The fruits are edible, and contain a very sweet sugar. The wood is useful to cabinet makers for inlaying. E. Jujube. I Giuggiolo, Zizzolo, Zenzero. M. Zinzal-Rhamnus Zizyphus L.-S. vulgaris Lam.

#### RHAMNUS (Tourn.) L.

Shrubs or small trees, with alternate entire leaves and herbaceous deciduous stipules. Small greenish flowers in small axillary cymes. Calyx tubulose or ovoid, 4-5 lobed. Petals 4-5 alternate with the lobes of the calyx, small and sometimes wanting. Stamens 4-5 inserted with the petals. Ovary free with 2-3 loculi, each with 1 ovule. Style 1, entire or divided, with 2-4 stigmas. Fruit a drupe with 2-4 one-seeded nutlets. Species about 70, mostly natives of the temperate regions of the northern hemisphere.

**RHAMNUS ALATERNUS L.** A thornless evergreen shrub or small tree (1-5 m.) Leaves coriaceous, persistent, glabrous, petiolate, oval and slightly serrated or almost entire, with a longitudinal nerve on each side of the median. Stipules linear-setaceous, shorter than the petiole. Flowers in axillary racemes on a short peduncle. Corolla wanting, or reduced to one yellowish petal. Drupe sub-globose, red and afterwards deep red, with 3 nutlets. (S) South Europe, Western Asia, Northern Africa. Jan-April. Naturalised in the Addolorata Cemetery, fortifications of Floriana, Boschetto, San Antonio, etc. E. Barren Privet. I. Puzzolo, Linterno, Hatro, M. Alaternu.

**RHAMNUS OLEOIDES L.** A small, much branched, and very thorny evergreen shrub, with scanty foliage (6-15 dm.) Very branched from the base, usually with contorted smooth stem and side twigs and branches finishing in a hard stout spine. Leaves coriaceous, persistent, alternate or almost opposed, glabrous, obovate, or ovate-lanceolate, entire or terminating with 1-2 teeth near the apex. Stipules linear-lanceolate. Lobes of calyx longer than the tube. Petals shorter than the calyx, and yellowish. Drupe ovate or roundish, yellowish or redish. (S) Italy, Spain, Greece, Arabia,

Himalaya, Algeria, Sicily etc. February-April. Common in ravines, valleys and rocky hills in Malta and Gozo. Rare in Comino-Rhamnus amygdalina Desf. E. Buckthorn. I. Spincervino, Ranno. M. Ziu.

## VITACEAE.

Sarmentose shrubs or trees, usually climbing. Leaves simple, palmate, digitate or imparipinnate, stalked, alternate, often opposite to branched tendrils, on thickened nodes. Stipules petiolar or wanting. Flowers hermaphrodite or unisexual, small, greenish, in simple or compound racemes, panicles or thyrsi. Calyx minute, 4-5 toothed, or entire. Petals 4-5, coherent at the top, sometimes coherent at the base; aestivation valvate. Stamens 4-5, inserted with the petals, or inserted outside the margin of an intrastaminal ring. Ovary superior, free, bilocular, each cell with 2 ovules; or with 3-6 loculi each with one ovule. Style short or wanting, with a capitate or peltate stigma. Fruit a berry. This family includes 11 genera and about 470 species, distributed mostly in the tropical and subtropical regions of the world, a few species inhabiting the temperate zones.

With the exception of the Vine, which is largely cultivated in all countries where it can be grown, for the production of wine and raisins, and also for the sake of the fresh fruit; and with the exception of certain American vines, now often grown for stock in regions where the vine succumbs to the invading *Phylloxera vastatrix*, all other species have chiefly an ornamental value.

## VITIS (Tourn.) L.

Sarmentose shrubs or trees, with deciduous, alternate, palmate leaves, and generally with branched tendrils arising from thickened nodes, opposite the leaves. Calyx with 5 obtuse indistinct lobes. Petals 5, connivent at the apex like a cap, free at the sides, which are pushed up by the elongating stamens and are shed off at blooming time. Stamens 5, opposite the petals. Ovary 2-locular, with 2 ovules in each loculus. Style wanting. Fruit a berry, 1-2 locular, with 1-4 seeds, sometimes seedless. Species 31 inhabiting the temperate and sub-tropical regions of the northern hemisphere.

**VITIS VINIFERA L.** A sarmentose shrub, with the old stems having a longitudinally fibrous bark, separating in long pieces. Leaves glabrous, or only moderately hairy on the undersurface, with 3-7 distinct lobes separated by more or less rounded spaces; cordate at the base, alternate, with toothed lobes. Flowers in compound racemes. Seeds pyriform, obtusely rostrate, hard. (S) Mediterranean region, as far as the Caucasus and Persia. April-May-Vitis Labrusca Scop non L. E. Vine, Grape-vine. I Vite. M. Dielja tal Gheneb.

The true wild vine (*V. vinifera* var. *silvestris* D.C) with dioecious flowers, and small globose brown-red berries is nowhere found in the Maltese Islands; but half wild forms of the var. *sativa* D.C., with hermaphrodite flowers, and rather small globose or oval yellow white berries, known by the name of-Insoja irkika ta Malta, as well as other half-wild sorts, are frequent in valleys and ravines.

There are at present over 140 sorts of grape-vines cultivated in Malta and Gozo, including at least 40 local sorts. There are also species and hybrids of American vines cultivated as grafting stock for the European vine, as well as several hybrid direct-bearers.

## ORD. ROSIFLORAE.

### CRASSULACEAE.

Herbs or suffruticose plants, with cylindrical fleshy stems and leaves. Leaves usually alternate, exstipulate, sometimes cylondrical or subulate, simple, entire, rarely pinnatilobed. Flowers actinomorphic, hermaphrodite or unisexual by abortion, in unilateral cymes, or in terminal usually dichotomous corymbs, rarely in spikes, rarely axillary or solitary. Calyx of 5 segments, rarely with 3-20 segments, persistent, imbricate. Petals free or connate into a tube, alternate with the segments of the calyx, imbricate or valvate in aestivation. Stamens adnate to the tube of the corolla or alternating with the petals, as many as the petals, sometimes double the number, with introrse 2-celled anthers. Scales as many as the carpels and inserted at their base. Carpels usually the same number as the petals, whorled, one-celled, usually distinct. Styles continuous with the back of the carpels. Ovules many and in 2 series in each carpel, anatropous. Follicles free, with ventral dehiscence. Embryo straight, exalbuminous.

The family includes 15 genera, with about 400 species, natives of temperate and subtropical regions.

The leaves of *Cotyledon orbiculata* and of other species are used to soften and remove corns. The juice of *Sedum acre* taken internally is purgative and emetic; outwardly it is used as rubefacient and for old ulcers. *Crassula rubens* is refreshing, diuretic and vulnerary. *Cotyledon umbilicus* is emollient and the leaves are used bruised for hard teats.

### COTYLEDON (Tourn.) L.

Calyx 5-parted. Corolla tubular or campanulate, 5-toothed or 5-cleft. Stamens 10, inserted on the corolla. Hypogynous scales 5, free, with many ovules in 2 series. Follicles 5. Includes about sixty species, natives of Europe, Africa, temperate Asia, Mexico and South America.

**COTYLEDON UMBILICUS-VENERIS L.** Plant perennial, glabrous. Stem annual, erect or ascending 1-5 dm. High, tuberous and perennial at the base. Leaves fleshy; the radical round or reniform, angular, crenate or lobed; the cauline wedge-like at the base. Raceme long, simple, sometimes slightly branched below, with many flowers. Stamens 10 inserted on the corolla, which is tubular or campanulate (P) Western Europe, the Mediterranean region, Abyssinia, the Canaries and western tropical Africa. April-May. E. Common Navel-wort. I. Cappelloni, Coperchiole, Ombellico di Venere. M. Zokret l'ghagiusa.

Var. *tuberosa* L.-*Cotyledon tuberosa* halacsy- *Umbilicus pendulinus* D.C. Leaves peltate, crenate. Bracts narrow, entire, equal to the peduncles or

shorter. Flowers pendulous; corolla cylindrical, 5-8 mm. Long, with rounded acute teeth 1/3 as long as the tube; whitish, greenish, yellowish, or reddish. On old walls and in rocky places. *Malta*, at Notabile, Wardia, Hemsia, Wied Ciampra, Pietà, Sliema, Wied Encita, Wied Znuber etc.

Var. *horizontalis* Guss.-*Umbilicus horizontalis* D.C. Differs from the preceding by the bracts being longer than the pedicels and by the subhorizontal flowers. Corolla ovoid, 4-6 mm. Long with triangular acuminate teeth. *Malta* and *Gozo*, frequent on old walls, on buildings in ruins, and on rocky ground.

#### SEMPERVIVUM L.

Calyx 6-cleft or with many segments. Petals 6-18, very slightly cohering at the base. Stamens twice as many as the petals. Hypogynous glands or scales short and rounded. Carpels 6-18; ovules numerous and pluriseriate in each carpel. Includes about 50 species natives of Central and South Europe, Western Asia as far as the Caucasus and the Himalaya, Abyssinia, Canaries and Madeira.

SEMPERVIVUM ARBOREUM L. Plant shrubby, 6-10 dm. High, with the scars of old leaves on the stems. Leaves glabrous, cuneate-spathulate, acute, serrated-ciliated along the margin, forming large rosettes at the end of the branches. Flowers golden yellow, densely inserted in a large, oblong panicle. Petals 8-12, divergent, oblong-lanceolate, twice as long as the calyx. Mediterranean region. (S) December-February. *Malta*, cultivated for ornament since 1830 and often naturalised on walls and in rocky or arid places at Wied is-Seuda Floriana, Gudja, Notabile etc. E. Tree House-Leek.

#### SEDUM (Tourn.) L.

Calyx 4-9 cleft. Petals 4-9 free. Stamens twice as many as the petals, or rarely as many as the petals. Hypogynous scales short and round. Carpels 4-9, with many ovules in 2 series in each carpel includes about 120 species, natives of cold and temperate regions of the northern hemisphere.

SEDUM RUPESTRE L. Plant perennial, glabrous, glaucous, with erect or ascending stems –3 dm. long. Leaves cylindrical-compressed, linear, mucronate or acuminate, sessile with a spur-like prolongation at the base. Flowers yellow, in an inflorescence reflexed before flowering: petals divergent, 5-8, acute acuminate or almost obtuse. (P) Europe, the Mediterranean region; naturalised in N. America May-July.-*Sedum tenuifolium* Delicata non D.C.-*S. amplexicaule* Gulia non D.C. E. Stone-crop.

Var. *nicaense* All. Plant woody at the base, often 4 or 5 dm. high; with oblong or ovoid leaves more or less ventricose, and densely imbricate at the top of sterile stems. Filaments hairy at the base.-*Sempervivum seditorme* Jacq.-*Sedum altissimum* Poir. *S. soluntinum* Tin. *Malta*, *Gozo* and *Comino*, frequent in valleys and in dry rocky places; and often common as at Wied Encita. Boschetto, Wied Babu, Ta Laurenti, Dingli etc.

SEDUM DASYPHYLLUM L. Plant perennial, 3-15 cm. high, with many branches sterile or fertile. Leaves alternate or opposed, hardly prolonged at the base, the lower surface very convex and therefore semicylindrical or semiglobose, more or less hairy and glandular. Flowers in a loose hairy and glandular corymb-like inflorescence. Petals 5-6, oval, about thrice the length of the calyx. Follicles suberect. (P) Central and Western Europe and North Africa. April-July. The typical form, as in the case of the preceding species, is not met with in these Islands. E thick-leaved Stone-crop.

Var. glanduliferum Guss. Leaves and branches hairy and glandular at least when young, as also the inflorescence and the sepals; petals white or pale violet.-Sedum hirsutum Ten. Non All. S. corsicum Duby *Malta*, here and there in rocky places; Wied Babu, Fakkrunia, Rdum tal Maddliena, il Kaus, San Giorg tal Fawwara, Dikkiena etc.

SEDUM STELIATUM L. Plant annual, with erect stems, 1-10 cm high branched above, glabrous. Leaves alternate or opposed, petiolate, obovate, flat on both surfaces, glabrous, obtusely toothed near the apex.

Follicles divergent and star-like at maturity. (A) Mediterranean region. March-June. *Malta*, rare at Wied Zenka a branch of Wied il Ghasel, and at Wied Hassaptan. The variety with light pink or flesh-coloured flowers is that so far met with.-Sedum deltoideum Ten.

SEDUM LITORIUM Guss. Plant annual, 2-12 cm. high. Leaves alternate, petiolate, shortly spurred at the base, obovate or oblong, obtuse, entire, flat on the upper surface, slightly convex on the lower surface. Petals 5, lanceolate, acute or mucronate, pale yellow, as long as the calyx or twice as long. Follicles erect-divergent. (A)

SEDUM LITORIUM Guss. Plant annual, 2-12 cm. high. Leaves alternate, petiolate, shortly spurred at the base, obovate or oblong, obtuse, entire, flat on the upper surface, slightly convex on the lower surface. Petals 5, lanceolate, acute or mucronate, pale yellow, as long as the calyx or twice as long. Follicles erect-divergent. (A) South Europe and Western Asia and Mediterranean Islands. *Malta*, Marfa and Cirkewwa, Gozo, Ras il Kala. *Comino* and *Cominotto*.

SEDUM CALRULEUM L. Vahl. Plant annual, slightly glandular and hairy in its upper parts, much branched, with a spreading bushy habit, 5-20 high. Leaves subcylindrical, obtuse, reddish or green. Inflorescence corymb-like, ample and loose. Petals 6-7, lanceolate, blue, rarely white. Stamens 10-15. Follicles with beak as long as the carpel. (A) Sicily, Sardegna, Corsica, Tunis and Algeria March-May. *Malta*, Gozo and *Comino*, frequent and often very common on rocky wastes especially in the small dried up ponds frequently met with in such localities.-Sedum heptapetalum Soir.-S. azureum Desf. E. Azure Stone-crop. M. Bezsulet il bakra.

SEDUM RUBENS L. Plant annual, u.s. deep green or reddish, with erect rigid stems 5-10 cm. high. Leaves u.s. obtuse. Flowers sessile or subsessile. Stamens 5-10. Calyx hairy. Petals lanceolate, acuminate. Follicles with a short



beak, more or less divergent star-like, finely tubercled or pubescent-glandular. (S) Central and South Europe, North Africa and the Canaries. March-June. *Malta*, *Gozo*, *Comino* and *Cominotto*, frequent in rocky and dry localities.- *Crassula rubens* L.

SEDUM C ESPITOSUM D.C. Plant annual, glabrous, 1-5 c.m. high bushy. Leaves oval alternate. Flowers subsessile in small dense corymb-like cymes. Petals 4-5, about thrice as long as the calyx, lanceolate, acuminate, white or flesh coloured. Follicles very spreading, lanceolate, striated, glabrous, with a short beak. (A) Mediterranean region. March-April. *Malta* Wied Ghomor, Boschetto, Wied Babu, Wied Encita, Wied il Ghasel. *Gozo*, Ta Cenc, Xlendi, Imgiar ix-Xini-*Tillaea rubra* L.-*Crassula caespitosa* Cav.- *C. verticillaris* L.

#### BULLIARDA D.C.

Calyx 4-cleft. Petals 4, entirely free. Stamens 4. Hypogynous scales oblong-linear, cuneate. Carpels 4, with several ovules in two series in each carpel. Includes about 12 species distributed all over the world.

BULLIARDA V Illanti (W) D C. Plant annual, glabrous, usually red or reddish, with slender prostrate rooting stems 2-8 cm. long, often bushy, branching dichotomously. Leaves opposed, connate at the base, oblong-linear, almost flat. Flowers small, pedicelled, in irregular cymes. Petals flesh coloured. (A) South Europe, North and South Africa, Abyssinia February-April. Frequent and often common in shallow pools on rocky wastes. *Malta*, Bahria, Wied Balluta, Wied ghomor, Wied Encita, Boschetto, Fakkania, Wied Kirda, Wied il Ghasel, Gharghar, St. Julians, St Pual "tat-targia", Imgiarr, Fomm-ir-rieh etc. *Gozo*, Xlendi, Ta Cenc, Nadur Xaghra etc. *Comino*-*Crassula Vaillantii* roth.-*tillaea Vaillantii* W.

#### TILLAEA L.

Calyx 3-4 cleft. Petals 3-4, entirely free. Stamens 3-4. Carpels 3-4, with 2 superimposed ovules in each crpel. Includes about 7 species, ntives of Central Europe, the Mediterranean region, the East Indies, Africa and the Canaries.

TILLAEA MUSCOSA L. Plant annual, 2-8 cm. high, with slender simple or branched stems, rooting at the base scending. Leaves opposed, connate, oblong-linear, glabrous. Flowers sessile or subsessile, in clusters of 2 or 3 in the axil of the leaves. Flowrs white or light pink. (A) Central Europe, the Mediterranean region and the Canaries. January-March. *Malta*, here and there on moss-covered rocks or walls in exposed situations, Wied Encita, Inghieret, Bingemma, Wied Kirda, Wied Balluta, Boschetto, Wied Xkora, etc-*Crassula muscosa* Roth. Non L. E. Mossy Red-Shanks.

### SAXIFRAGACEAE.

Herbs or suffrutescent plants sometimes woody. Leaves alternate or opposite, rarely whorled. Stipules wanting in the herbaceous species; interpetiolar and deciduous in the species. Flowers actinomorphic, rarely zygomorphic, hermaphrodite. Calyx usually of 5 sepals distinct or connate. Petal 5-rarely less, inserted on a disk, alternate with the sepals, usually imbricate in aestivation, rarely wanting. Stamens as many as the petals, or double, rarely indefinite, with filiform subulate filaments. Anthers 2-celled, introrse, dehiscent longitudinally. Carpels usually 2 rarely 1 or 3 or 5, free or united; styles and stigmas simple, sometimes connate. Ovules usually numerous, anatropous. Fruit a capsule, rarely indehiscent or fleshy, the carpels separating at dehiscence along their inner margin. Seeds usually numerous and small, rarely solitary. Embryo straight, in the axis of a fleshy albumen.

The family includes 69 genera, with about 560 species, natives mostly of cold and temperate regions.

The leaves and roots of *Saxifraga granulata* and other species were reputed lithontriptics. *Saxifraga tridactylites* was employed as a colagogue.

#### SAXIFRAGA (Tourn.) L.

Calyx 5-cleft or 5-parted. Petals 5, perigynous. Stamens 10, perigynous, without intervening nectariferous glands. Ovary 2-celled, with 2 styles, rarely more. Capsule many-seeded, with the accrescent styles developing as horn-like processes. Includes about 160 species, natives of cold and temperate regions of the northern hemisphere.

**SAXIFRAGA TRIDACTYLITES L.** Plant annual, rarely perennial, glandular and hairy, with an erect or ascending leafy stem, 2-15 cm. high. Leaves fleshy, without calcareous productions, 3 to 5-cleft or toothed, with lateral segments often bifid, the upper having a short petiole or sessile, often linear or entire; sometimes all entire, lanceolate or linear. Calyx 5-toothed with oval teeth. (A) or (P) Europe, the Mediterranean region and North America. February-April. *Malta*, very rare: only known to exist at Wied Encita on a stretch of rock on the Zebbug side of the valley. The plants met with belong to the form *exilis* Pollini, with simple and very slender stem mostly with one or two flowers on long filiform peduncles, the lower leaves being often entire.-*Saxifraga tenerrima* Wk. E. Nail-wort, Whitlow grass. I. Lucernicchia.

#### ROSACEAE.

Herbs or woody plants. Leaves alternate, very rarely opposite, stipulate or very rarely exstipulate. Flowers actinomorphic, rarely zygomorphic, hermaphrodite, sometimes unisexual. Calyx usually with 5 segments, rarely with 4, imbricate or valvate in aestivation. Petals free, as many as the sepals, inserted on the calyx, imbricate in aestivation; sometimes wanting. Stamens usually indefinite, in many series, inserted on the calyx. Anthers 2-celled, introrse. Pistil very variable. Ovules anatropous. Embryo straight, exalbuminous very rarely albuminous.

The family includes 71 genera with about 1000 species, distributed all over the world.

To the rosaceae belong many of our most valuable fruits, viz: THE Apple (*Pirus Malus*), the Pear (*Pirus communis*), the Service-tree (*Pirus Sorbus*), the Medlar (*Mespilus germanica*), the Loquat (*Eryobotrya japonica*), the Azarole (*Crataegus Azalorus*), the Almond (*Prunus Amygdalus*), the Peach and Nectarine (*Prunus persica*), the Plum (*Prunus domestica*), the Apricot *Prunus Armeniaca*), the Cherry (*Prunus Cerasus*), the Strawberry (*Fragaria vesca* and other species) etc. *Prunus Laurocerasus* contains hydrocyanic acid, and its water is used as a sedative. From the fruit of the quince a jam is prepared which has astringent qualities and is used in diarrhea. Confection of roses prepared from the petals of *rosa gallica*, is also used as astringent. An infusion of the flowers of *rosa bifera* has the same qualities. Hydrocyanic acid, which is a frightful poison, is also contained in the essence of bitter almonds, prepared from bitter almonds as well as from the bitter kernel of other stone-fruits.

#### TRIBE I-AMYGDALAEAE.

Flowers hermaphrodite, hypogynous. Calyx caducous. Ovary with only one carpel, with 2 ovules. Fruit a drupe.

#### PRUNUS (Tourn.) L.

Flowers in clusters, or corymbose or racemose. Calyx mostly campanulate, with 5 spreading or reflexed teeth, having on its throat the petals and stamens. Petals 5, obovate, spreading. Stamens 20 or more. Ovary one-celled, with a simple style and capitate stigma. Drupe with fleshy and juicy mesocarp, rarely fibrous and dry; with a stony endocarp. Seeds 1 or 2, with a membranous testa. Includes about 75 species natives of temperate regions in the northern hemisphere.

*PRUNUS AMYGDALUS* Stokes. A tree 5-10 m high. Leaves oblong-lanceolate, glabrous, slightly serrated, with a petiole at least as long as the breadth of the leaf. Flowers appearing before the leaves, in the axils of leaves on preceding year's wood. Teeth of calyx hairy along the margin. Petals white or rosy, obovate, emarginate, with a red claw. Drupe oval compressed, green, tomentose, with a dry fibrous mesocarp, peeling off naturally at maturity. Stone or nut oblong, with a smooth perforated surface. (S) Native of Central Asia and Turkestan: extensively cultivated in many countries. December-February.-*Amygdalus communis* L.-*Prunus communis* Arc. E. Almond. I. Mandorlo. M. Lewza.

Var. *amara* C.K. Schneid. Seed bitter. Style longer than the outer stamens.-*Amygdalus communis* var. *amara* D.C.-*Amygdalus amara* Heyne. Cultivated in *Malta*, *Gozo* and *Comino*, and often naturalised or self-sown in valleys and ravines E. Bitter Almond, I. Mandorlo Amaro. M. Lewza morra.

Var. *dulcis* Mill.-*Prunus Amygdalus* var. *sativa* Asch. Et Gr. Seed sweet. Style as long as the outer stamens. Cultivated and sometimes self-sown u.s. E. Sweet Almond. I. Mandorlo dolce. M. Lewsa helua.

In the form: *fragilis* Ser., the endocarp is easily brittle. In the form: *elongata*, the stone is elongated and acutely pointed, often slightly curved and the endocarp is more or less easily brittle. In the form: *rugosa*, the pericarp is rugose or thrown into folds and protuberances externally, the drupe being also larger, and the endocarp more or less mucronate, and the flowering season is later than in most varieties.

**PRUNUS PERSICA** Stokes. A shrub or small tree 3-5 m. high. Leaves larger and longer than in the preceding species, with a petiole not longer than half the breadth of the leaf. Calyx u.s. with villous teeth. Petals obovate, intense pink or red, of varying length. Endocarp ovoid, more or less mucronate, deeply rugose and pitted: mesocarp fleshy juicy, clinging to the stone or free from it. Drupe tomentose and hairy on the outside. Seed bitter. (S) Native of China, but long cultivated in most temperate countries March-April. *Malta*, *Gozo* and *Comino*, commonly cultivated and frequently met with self-sown.-*Amygdalus Persica* L.- *Persica vulgaris* Mill. E. Peach. I. Pesco or Persico. M. Hauha.

Var. *Nuci-persica* Borkh.-*Persica levis* Lam.-*Prunus Persica* var. *levis* Arc. Drupe glabrous. Cultivated u.s. and sometimes found self-sown in gardens. E. Nectarine. I. Pesco-noce. M. Nucipersica.

**PRUNUS ARMENIACA** L. A shrub or tree, 3-7 m. high, with oval or rounded acuminate leaves, glabrous, shining, coriaceous, cordate at the base, doubly toothed, with a very long petiole. Flowers appearing before the leaves, axillary, solitary or in pairs. Calyx with hairy segments; petals obovate, white or light pink. Drupe globose or oblong, tomentose and velvety, fragrant, orange, yellowish or whitish. Endocarp globose-compressed, stony, smooth. (S) Native of Northern China and Central Asia; commonly cultivated in many varieties. March-April. *Malta* and *Gozo*, frequently cultivated and often found self-sown.-*Armeniaca vulgaris* Lam. E. Apricot. I. Albicocco. M. Berkuka.

**PRUNUS DOMESTICA** L. A shrub or small tree, 1-4 m. high. Leaves oval, obovate or oblong more or less rugose, and hairy on the lower surface, often with glandular teeth. Stipules toothed, ciliated. Flowers appearing before the leaves, or rarely along with the leaves, usually axillary and geminate, with long hairy peduncles and hairy calyx. Petals rounded or elliptical, white. (S) Western Asia and southern Europe; commonly cultivated in many varieties or forms. March-April. E. Plum. I. Pruno, Susino M Pruna.

Var. *oeconomica* Borkh. Young shoots glabrous, but hairy in some of the cultivated varieties. Drupe oblong, oval, or pear-shaped: purplish violet and harsh in the wild forms, variable in colour and sweet in the cultivated forms. E. Plum I. Pruno, susino. M. Ghain il bakra, Ghambakra or Pruna. *Malta* and *Gozo*, commonly cultivated: sometimes half-wild as at Boschetto, San

Antonio, Wied il Lunziata (near Dingli) etc in Malta; and at Wied ir-Rihan, Wied il Lunziata and San Blas in Gozo.

Var. *italica* Borkh.-*Prunus Claudiana* Poir. Young shoots hairy: leaves almost glabrous on the under surface: drupe globose, usually greenish, sometimes coloured. E. Plum. Gage, Greengage. I; Regina Claudia M. Ghambakra bajda, Ghambakra. *Malta*, *Gozo* and *Comino*. Commonly cultivated; hardly ever found half-wild or self-sown.

Var. *insititia* L. Young shoots hairy; leaves more or less hairy on the lower surface: fruit globose, rather small, deep purple or deep purplish blue and very harsh and astringent in the wild form, and of larger sizes variable colour, and sweet, in the cultivated forms. *Malta*, *Gozo* and *Comino*. Cultivated for stock on which to graft other plums and apricots; very often found growing wild or naturalised in gardens ravines and valleys. E. Bullace or Wild Damson. I. Prugnola da da siepe, Pruno M. Prajn (wild form with harsh fruits), Pruna the cultivated or sweet-fruited forms).

**PRUNUS SPINOSA L.** A shrub 1-3 m high, with straggling branches, ashy-white, more or less spinous or terminating in a spine. Young shoots hairy; leaves obovate or elliptical, often oblong or lanceolate, acute, double toothed, more or less hairy on the lower surface. Flowers appearing before the leaves, rarely along with the leaves, rather small, with obovate white petals. Drupe small, erect, bluish-black, very harsh and astringent, with obtuse stone. (S) Europe, the Mediterranean region; naturalised in North America. February-April. *Malta*, here and there, in gardens and valleys: often used as stock for grafting plums and apricots. The fruit is sometimes used for jams, like that of the Bullace. E. Black-thorn or Sloe-tree. I. Prugnolo, Pruno selvatico, Vegro. M. Prajn tax-xeuk, Pruna salvagga.

**PRUNUS CERASUS L.** A shrub or small tree 2-4 m. high. Leaves oval-oblong, acuminate, more or less coriaceous, smooth, glabrous, shining, doubly serrated. Stipules ciliated and glandular; petiole usually without glands. Flowers rather small, in umbel-like clusters, appearing shortly before the leaves or along with them: petals white, oval, spreading, entire or emarginate. Drupe more or less acid, with the epicarp easily peeling off the pulp. (S) Central and Eastern Europe, Western Asia as far as Siberia cultivated elsewhere. March-April.- *Cerasus vulgaris* Mill.

Var. *austera* L.-*Prunus austera* Ehrh.-*Cerasus Caproniana* var. *griotta* Ser. Leaves oval or oval-oblong, pointed; stipules quickly caducous. Drupe spreading or sub-erect, dark purple, with reddish, acid, bitterish juice; stone easily separating from the peduncle, which is rather long. E. Hautbois Cherry. I. Amarena, Marena. M. Amarena. Naturalised in valleys and gardens, especially on clayey or moist soils; *Malta*, at Ghain il Cbira, Boschetto, Melleha, Burnuhhala, Bahria etc. *Gozo*, at Xlendi and Nadur. Used as stock for the cultivated cherries.

**PRUNUS MAHALEB L.** A shrub or small tree 1-3 m. high, much branched, with spreading often spinous branches. Leaves roundish-oval,

membraneous, glabrous, toothed, with recurved glandular teeth. Stipules toothed-ciliated. Flowers small, white, in shortly peduncled bracteolate corymbs. Petals obovate. Drupe erect, black, ovoid, acute, with an almost smooth globose compressed stone. (S) Central and southern Europe, Asia Minor as far as the Caucasus and Turkestan. March-April. *Malta*, introduced in 1905: used as stock for grafting cherries; naturalised in the Boschetto valley.-*Cerasus Mahaleb* Mill. E. Mahaleb Cherry. I. *Ciliegio canino*.

## TRIBE II-ROSEAE.

Calyx persistent. Ovary made of one or many free carpels, each with one ovule. Fruit an achene or small drupe. Flowers hermaphrodite or polygamous.

## POTENTILLA L.

Flowers hermaphrodite in corymb-like cymes, or solitary. Calyx with 5 segments, rarely 4, and with a second calyx with smaller segments below it. Petals 5, rarely 4. Stamens numerous, rarely reduced to 5. Carpels numerous, rarely reduced to 5, with lateral caducous tyle. Receptacle more or less globulose or conical, more or less hairy, dry and not accrescent. Achenes forming a head, small, scabrous or rugose, glabrous or hairy, more or less reniform. Includes about 120 species, mostly natives of cold and temperate regions in the northern hemisphere.

**POTENTILLA REPTANS L.** Plant perennial, with long stolons or long creeping and rooting stems, with applied hairs. Radical leaves palmate, the others more or less digitate, persistent, with a long petiole, having 5, rarely 3-7, oblong obovate leaflets, entirely obtusely toothed; stipules mostly entire or with 1-2 teeth. Flowers in corymb-like cymes, yellow, 2-3 cm. in diameter. Petals emarginate. Achenes granulose-scabrous. (P) Europe, the Mediterranean region, Northern Asia as far as Japan, Abyssinia; naturalised elsewhere. April-June. *Malta* and Gozo, frequent along streamlets and in moist valleys E. Creeping Cinquefoil I. Cinquefolio. M. Frauli salvagga.

**POTENTILLA HIRTA L.** Plant perennial, more or less hirsute, without stolons, with a descending rhizome and erect or ascending stems, branched above. Leaves digitate, the lower with 5 to 7 leaflets, the upper with 5 to 3 leaflets, all oblong-lanceolate, obtuse, with large teeth. Stipules large entire, or laciniate. Flowers in loose cerymbs, u.s., petals emarginate, yellow, twice as long as the calyx. Achenes transversely wrinkled. (P) Central Europe, the Mediterranean region, Siberia; naturalised in North America. April-May. *Malta*, in rather dry localities, Wied Encita according to Delicata, is-Sisien according to Gulia. The plants referred to by Delicata and Gulia belonged to the var. *pedata* W-Potentilla pilosa D.C., mostly with pedate leaves having 7 leaflets entirely toothed, and with golden yellow flowers.

## FRAGARIA (Tourn) L.

Flowers hermaphrodite or polygamous-dioecious, corymbose or solitary. Calyx with 5 segments; petals 5. Stamens about 20. Carpels many. Receptacle conical, glabrous, fleshy, accrescent, and easily detaching itself at maturity. Achenes inserted or immersed in the fleshy substance of the receptacle. The rest as in *Potentilla*. Includes 6 species natives of temperate regions in the northern hemisphere, one being native of Chili.

**FRAGARIA VESCA L.** Plant perennial, bushy, with short rhizome, and generally with long stolons. Leaves with long petiole and with 3 large obovate leaflets with large teeth on the upper 2/3, green and slightly hairy on the upper surface, often whitish or silvery on the lower surface. Peduncle of inflorescence naked, furnished with an involucre made of a bract or leaf. Fruit globose or ovoid, with conical or obtuse or even depressed receptacle, fleshy, juicy and fragrant. (P) Europe, North America, Western and Northern Asia as far as Japan, the Canaries: cultivated elsewhere. March-August. *Malta* and *Gozo*, cultivated, and sometimes almost naturalised on irrigated lands.

The variety usually cultivated is *F. vesca* var. *sativa* L.-*F. vesca* var. *pratensis* L.-f. *moscata* Duch.-*F. elatior* Ehrh., having the segments of the calyx spreading or reflexed, stolons with a scale at the nodes between one rosette and the next; fruits with few achenes. E. Wood Strawberry. I. *Fragola*. M. *Frauli* *Maltia*.

The variety *semperflorens* Duch., very similar to the preceding but with narrower leaflets, and with longer conical, often fusiform fruits, thickly studded with achenes, flowering and fruiting again in autumn is also occasionally cultivated. E. Four-seasons strawberry. I. *Fragola rificiorente*. M. *Frauli ta l-erbgha staguni*.

*Fragaria chiloensis* x *virginiana* Focke.-*F. Ananassa* Duch.-*F. grandiflora* Ehrh., is cultivated in gardens in several forms. E. Large or English Strawberry I. *Fragola grossa*, *Fragolone*. M. *Frauli inglisa*.

## RUBUS (Tourn.) L.

Flowers hermaphrodite in a panicle or raceme. Calyx with 5 segments. Petals 5 obovate or oblong, inserted on the throat of the calyx. Stamens indefinite, inserted on the throat of the calyx. There is no involucre of the calyx. Carpels many, with persistent style, with 2 ovules in each, of which generally only one develops as seed. Receptacle conical or hemispherical, spongy or dry; carpels developing as small drupes with a stony rugose endocarp, forming together a globose or oblong fruit or sorosium. Includes about 180 species mostly natives of the temperate regions in the northern hemisphere.

**RUBUS FRUTICOSUS L.** A shrubby plant 1-3 m. high, with long, prostrate or arching stems, more or less angular and armed with strong thorns mostly hooked; often rooting at the extremity; with compound palmate leaves having 3-5 leaflets, ovate, unequally and doubly toothed, the terminal being larger

and furnished with a longer petiole; principal petiole thorny, usually the midrib of the leaflets is also thorny. Flowers in terminal racemes, often collected in a large corymb or panicle. Calyx tomentose and often thorny, with acuminate segments. Petals oval or oblong, longer than the calyx, white or rosy. Fruits erect, acidulous, eatable, consisting of many small glabrous drupes, rarely slightly hairy, black or reddish black, or bluish black. (P) Europe, the Mediterranean region, South Africa, North America; naturalised elsewhere. April-August. E. blackberry. I. Rovo, Rogo. M. Ghollek.

Var. *ulmifolius* Schott.-*Rubus rusticanus* Merc.-*R. anisodon* Sudre. Leaflets tomentose grey or white on the undersurface: stipules linear. Stems powdery, and metallic grey when young. Inflorescence paniced, usually large, powdery-tomentose, with dense stellate hairs. Western Europe, Mediterranean region as far as Mesopotamia: naturalised in South America and Ceylon. *Malta*, frequent and often common, Wardia, San martin, Gneina, Imtahleb, Ghirghenti, Ghain il Cbira, Boschetto, Wied Encita etc. Gozo, Imgiar -ix-Xini, Xlendi, Nadur, Migiarrro etc. *Comino*.

Var. *caesius* L.-*Rubus acheruntinus* Ten. Stems short, prostrate, cylindrical, powdery-bluish, with slender needle-like thorns. Leaves mostly ternate, green or tomentose-grey on the lower surface. Stipules linear-lanceolate. Inflorescence corymbose: calyx in fruit with erect segments. Fruits powdery bluish Europe and Siberia. *Malta*, on rocky ground at Wardia. Gozo, at Xlendi, Wied il Lunziata, Wied ir-Rihan, San Blas etc.

## POTERIUM L.

Flowers hermaphrodite or polygamous-monoecious, in spikes or heads, with 2 scales at the base. Calyx tubular-urceolate, stamens inserted on the thickened throat; limb of calyx 4-cleft. Involucral calyx and petals wanting. Stamens 4 to 30. Carpels 1 or 2, rarely 3, with apical style: stigma capitate or brush-like. Achenes 1-3, included in the calyx. Includes about 30 species, natives of temperate regions in the northern hemisphere.

POTERIUM SANGUISORBA L. Plant perennial, hairy below or entirely glabrous, often glaucous, with an aromatic flavour and a woody or hardened roostock. Stems angular; leaves imparipinnate with 4 to 12 pairs of round or oval serrated leaflets. Flowers in globose or ovoid heads, more or less large, the upper flowers being female, the middle flowers mostly hermaphrodite, and the lower male. Calyx with 4 broad oval segments, spreading, margined with white. Stamens 15-30 exserted; styles exserted. Stigma brush-like, red. Fruit tetragonous, not winged, more or less reticulate rugose. (P) Europe, the Mediterranean region, Siberia, Japa, South Africa; naturalised in North America. March-May. The typical form is not met with in the Maltese Islands.-*Sanguisorba minor* Scop. E. Salad Burnet. I. Salvastrella, Bibinella. M. Tursin il Ghoul.

Var. *polygamum* W. et K.-*Poterium muricatum* Spach.-*Sanguisorba muricata* Greml.-s. *polygama* Beck. Non Nyl. Fruit larger markedly tetragonous, winged at the angles, with large wrinkles or ridges acutely toothed on the



sides forming the wings. *Malta, Gozo and Comino*, frequent and often common, in many localities.

### ROSA (Tourn.) L.

Thorny shrubs. Flowers hermaphrodite, solitary or corymbose. Tube of receptacle continuous with the receptacle, more or less pear-shaped, with 5 rarely 4 segments, all entire or the outer one or two pinnatifid, caducous or persistent. Involucral calyx wanting. Petals 5, large, obcordate. Stamens indefinite. Carpels many, inserted on the inner sides of the receptacle, each furnished with a style. Styles free or glued together at the apex. Fruit made of the fleshy receptacle, red, yellow or black at maturity, containing stony achenes slightly covered with hairs. Includes about 75 species, inhabiting the northern hemisphere.

**ROSA SEMPERVIRENS L.** Plant prostrate or sarmentose. Leaves with coriaceous, shining, usually glabrous leaflets, with the apex often turned sideways. Middle leaves on flowering branches usually with 5 oblong-oval, toothed leaflets. Bracts persistent and becoming reflexed. Inflorescence hairy and glandular, usually with several white flowers. Styles exerted, glued together at the apex, forming a styler column as long as the outer stamens. Sepals entire, oval, abruptly and briefly acuminate. Fruiting receptacle ovoid or spherical. (S) South Europe and North Africa. April-June. In moist rocky valleys. *Malta*, rare, at Boschetto, Wied Encita, Wied il Ghasel (Zenka). *Gozo*, Migiarro.-*rosa microphylla* Desf. Non Roxb. The plant at Wied Encita belongs to the form: *floribunda* Gus., bearing corymbs with 5-7 flowers. The plant at Wied il Ghasel belongs to the form: *microphylla* D.C.- minor Guss, in which the flowers are often solitary and the leaflets are very small and acutely serrated. There are in the Argotti Gardens plants with larger flowers shaded pink or light rose, evidently a hybrid *sempervirens* x *gallica*. E. Evergreen Rose. M. Ghirlanda tal wied.

**ROSA GALLICA L.** Plant bushy, not sarmentose, low, freely suckering, with usually simple erect stems, with more or less hooked thorns, and also with many stiff glandular bristles. Middle leaves of flowering branches with 5 leaflets. Leaflets broad, oval or elliptical. Inflorescence often one-flowered, without bracts. Sepals large glandular, becoming reflexed and then caducous, the outer more or less pinnatifid. Corolla large, lively pink or purplish rose. Receptacle hispid-glandular. (S) Central and South Europe, Asia Minor, the Caucasus. April-June. *Malta*, rare, at Wied il Ghasel, Ghirghenti, Kattara, Ghemieri, near Ta Baldu, Wardia. *Gozo*, also rare, Wied il Lunziata.

The local plants belong to var. *eristyla* R. Kell, having thickly hairy and woolly styles. A semi-double form is also known.

Var. *provincialis* Ait. Plant higher, with smaller and stiffer leaves, with stems branched above. Flowers very double, of a darker pink, very sweet scented. Cultivated, and often naturalised, at San Antonio and Boschetto. E. Provence Rose. M. Fiurett, Warda taz-zejt.

*Rosa damascena* Mill., probably a hybrid between *R. gallica* and *R. canina*, having an erect habit, almost sarmentose, usually without suckers, with a corymb-like inflorescence, and double or semi-double flowers, of a lively rose and very sweet-scented, is cultivated in many places and often naturalised in old gardens, under the name of Warda tal Madonna, W. tal hall, W. ta Malta.

**ROSA CANINA L.** Plant erect, sub-sarmentose, often suckering. Stems with hooked thorns. Leaflets large, oval or oval-elliptical, glabrous or pubescent, with simple or compound teeth, sometimes glandular. Flowers rosy or white. Sepals reflexed after flowering, the outer pinnatifid and soon withering and caducous. Receptacle smooth, rarely hispid and glandular. (S) Europe, North Africa, Western Asia as far as Siberia; naturalised in North America. April-June E. Dog Rose.

Var. *dumetorum* Thuill. Leaflets pubescent, with simple teeth and smooth pedicels. Gozo, very rare, at Ta Cenc, according to Gulia.

### TRIBE III-POMEAE.

Flower hermaphrodite. Calyx persistent. Ovary made of 1-5 connate carpels, continuous with the calyx, forming one inferior ovary, 1-5 celled, rarely free. Fruit a pome.

### CRATAEGUS (Tourn.) L.

Flowers in corymbs, furnished with caducous bracts. Calyx with urceolate or campanulate tube, with the petals and stamens inserted on its throat. Limb of calyx 5-cleft. Petals 5, spreading, roundish. Stamens 10-20. Ovary 1-5 celled, with 2 ovules in each cell; styles as many as the cells. Pome fleshy, surmounted by the dry lobes of the calyx, with a small depressed receptacle, and containing one to three stony nutlets, usually one-seeded. Includes about 30 species, natives of temperate regions in the northern hemisphere.

**CRATAEGUS AZAROLUS L.** Shrub or small tree with woolly-tomentose young shoots and peduncles. Spines stout but few. Leaves coriaceous, obovate-cuneate, with segments entire or 1-3 toothed, the media segment being often trilobed. Flowers about 2 cm. in diameter, in corymbs with 2-5 styles. Fruit globose or depressed, 1-2 cm. in diameter, sweet, eatable, coral red, or yellowish, with nutlets flat on the inner side. (S) Mediterranean region and South Russia; cultivated or naturalised elsewhere. March-May.-*Mespilus Azarolus* L. E Azarole. I. Lazzarolo, Azzeruolo. M. Ghanzalori. The typical form is not met with.

Var. *ruscinonensis* Gren. Leaves greyish-green, 3-5 lobed; leaves and inflorescences almost glabrous. Corymbs loose, styles 2-3. *Malta*, rather rare, in cool moist valleys; Boschetto, Wied Kirda, Wied Babu, Wied il Cbir, Ghirghenti, Ta Baldu etc. Gozo, at Wied Imgiarr ix-Xini.

CRATAEGUS OXYACANTHA L. Shrub or small tree, usually bushy and thorny, with glabrous or hairy young shoots and peduncles. Leaves obovate or rhomboid, mostly cuneate, lobed or cleft in 3-5 segments, which are cut rooted or entire. Stipules falciform, foliaceous, briefly petiolate, larger in the sterile branches, toothed or cut. Flowers white, very rarely rosy, in simple or compound corymbs, 1-1½cm. in diameter. Sepals more or less oval, acute or acuminate. Styles 1 or 2 very rarely 3. Fruit small, oval or globose, about 1cm. in diameter, coral-red, very rarely yellow or whitish, insipid, hardly eatable, with nutlets having mostly 2 grooves on the inner surface. (S) Europe, the Mediterranean region as far Siberia, India and Tibet; cultivated or naturalised elsewhere. March-May.-Mespilus Oxyacantha Crantz. E. Hawthorn. I. Bianco-spino. M. Zaghrun.

Var. monogyna Jacq. Branches and spines thicker. Leaves and inflorescence almost glabrous; leaves more deeply cut, with divergent segments. Corymbs many-flowered. Style one; fruit smooth, with only one nutlet, rarely with 2.-Crataegus Oxyacantha var. monostyla D.C Area of the species, *Malta*, frequent but not common in rocky valleys and ravines, at wied Encita, Boschetto, Ghain il Cbira, Ghirghenti, Wied Kirda, Ta Baldu, Wied hazrun, Melleha etc. Gozo, Xlendi, Nadur. All plants hitherto examined belong to this variety.

#### MESPILUS (Tourn.) L.

Flowers solitary, having persistent bracts. Calyx with broadly campanulate tube, having 5 foliaceous segments. Ovary 5-celled. Styles 5, glabrous. Fruit a pome more or less globose depressed, pulpy, sweet when over-ripe, surmounted by the persistent and dried segments of the calyx, with a broad depressed receptacular area. Includes only one species.

MESPILUS GERMANICA L. A shrub, spiny in the wild state, with villous young shoots. Leaves oblong-elliptical, more or less coriaceous, acute or acuminate, minutely serrated, with a very brief petiole. Stipules oval, falling off very early. Flowers large, subsessile. Calyx tomentose, with lanceolate-linear segments, petals white, obovate or obcordate, about as long as the segments of the calyx. Fruit pubescent, 3-4 cm in diameter, of a rusty colour more or less metallic, eatable. (S) Asia Minor as far as the region of the Caspian sea, naturalised in Central and south Europe. April-May. *Malta*, rare, Boschetto and Bahria. Gozo, frequent in the valley between Kala and Nadur, and at Pergla. E. European medlar. I. Nespolo comune. M. Fomm il-lipp, Nespli tedischi.

#### ERIOBOTRYA Lindl.

Flowers in a dense short panicle. Calyx campanulate, obtusely 5-toothed. Petals 5, smallish. Stamens numerous. Ovary 5-celled, with 5 styles hairy at the base. Fruit a pome, elliptical or globose or pyriform, with an acidulous sweetish juice, with large softish seeds more or less greenish, enveloped in a

membraneous testa. Includes about 10 species natives of Eastern subtropical Asia.

**ERIOBOTRYA JAPONICA** Lindl. A tree, 3-8 m. high, evergreen, with tomentose rusty branches. Leaves large 15-30 cm. long, oblong-lanceolate, coriaceous, rugose, tomentose on the lower surface, serrated, with a very short petiole. Panicle and calyx woolly-tomentose, more or less rusty. Petals yellowish white, oblong-yellow, smooth, eatable, 3-6 cm. long, with green persistent bases of segments of calyx turned in and enclosing the receptacular area. (S) China and Japan; cultivated and often naturalised elsewhere. October-December. *Malta* and *Gozo*, cultivated since 1811, often met with self-sown in gardens-*Mespilus japonica* Thunb. E. Japanese Medlar, Loquat. I. Nespolo del Giappone. M. Nespli.

A seedless form (form: *apyrena*) is now often propagated by grafting or budding.

### PIRUS (Tourn.) Lem.

(*Pyrus* L.)

Flowers in corymbs or in umbels, rarely solitary. Calyx urceolate or obconical, or broadly campanulate, 5-toothed or 5-cleft. Petals 5, more or less round, furnished with a claw. Stamens 20 or more. Ovary 2-5 celled, with 2 rarely more ovules in each cell. Styles 2-5, free or almost free. Fruit a pome surmounted by the remains of the segments of the calyx, with a depressed receptacular area; having 2-5 cells enclosed in a cartilaginous or papery or hard endocarp, each with 1 or 2 seeds, rarely more. Includes about 35 species, natives of temperate and mountainous regions of the northern hemisphere.

**PIRUS CYDONIA** L. A thornless shrub 1-4 m. high, with oval, entire leaves, greyish tomentose on the lower surface; stipules linear, caducous. Flowers solitary, large, subsessile. Calyx broadly campanulate, 5-cleft, densely tomentose, with oval-lanceolate segments, reflexed after flowering. Petals rosy outside, white internally, roundish. Ovary 5-celled, with several ovules in each cell. Styles 5. Fruit large, at first cottony-tomentose, golden yellow, fragrant, astringent. (S) Western Asia. March-May. *Malta* and *Gozo*, cultivated for its fruits which are used for making jams, and is also largely used as stock for grafting pears; often met with naturalised or half-wild in old gardens and valleys. E. Quince. I. Melo-cotogno, Cotogno. M. Sfargel.-*Cydonia vulgaris* Pers.

The form: *piriformis* Medic.-*Cydonia pyriformis* Medic., has pear-shaped fruits; and the form: *maliformis* Mill.-*Cydonia maliformis* Mill., has apple-shaped fruits. Both are met with. The variety; *lusitanica* Fiori.- *Cydonia lusitanica* Mill., has a taller habit of growth, and its fruit is very large, gibbous or grooved, pyramidal-truncated. It is cultivated at Siggieui.

**PIRUS COMMUNIS L.** A shrub or tree, 2-8 m. high. Leaves with short or long petiole, oval-elliptical or more or less rounded, convolute in the bud, glabrous and pale green on the undersurface when adult, minutely serrated. Tipules linear, caducous. Flowers in simple corymbs, white or sometimes rosy externally. Anthers reddish violet. Calyx woolly-tomentose, urceolate-obconical, 5-toothed, becoming reflexed after flowering. Ovary 5-celled, each with 2 ovules; styles 5 free. Fruits more or less large, mostly pyriform. (S) Central and Southern Europe, Western Asia; cultivated or naturalised elsewhere. February-April. *Malta*, frequent at San Martin, Ghain il Cbira, Boschetto, Wied Encita, Wied Babu, Wied Xcora, Wied Dalam, Bahria. Also commonly cultivated in *Malta* and *Gozo*, E. Wild Pear. I. Pero selvatico. M. Langias Salvagg.

Var. *Achras Gaertn.* Leaves rounded, oval or oblong, hairy when young. Tube of calyx hairy. Fruit small, pear shaped or top-shaped, rusty yellow at maturity, hard and astringent. Branches and twigs more or less spiny. E. Wild Pear. I. Pero selvatico. M. Langias salvagg, often miscalled Ziju. The plant is often used as stock for grafting on the cultivated pears. The flowers are sometimes brought to the flower-sellers for their earliness in February. Most plants met with in the above mentioned localities belong to this variety.

Var. *amygdaliformis Vill.-Pirus parviflora Desf.- P. oblongifolia Spach.-Leaves* long, elliptical or lanceolate, almost entire, glabrous, glaucous on the lower surface when adult, with a petiole much shorter than the leaf. Petals smaller, oblong or obovate. Branches and twigs rarely spiny. Fruit small, top-shaped or globular, u.s. *Malta*, at Wied encita, San martin and Bahria.

Var. *sativa Lam. Et D.C.-Pirus domestica Medic. Non Ehrh.* Plant very rarely spiny. Leaves oval-elliptical or roundish, minutely serrated, with petiole often about as long as the leaf, glabrous, pale green on the lower surface when adult. Fruit very variable in shape, size and colour, soft, sweet and generally eatable. *Malta* and *Gozo*, commonly cultivated in many varieties.

**PIRUS MALUS L.** A shrub or tree 2-8 m. high. Leaves oval or oval-oblong, mostly doubly toothed. Calyx woolly-tomentose, 5-toothed u.s. Petals white, mostly rosy externally, rather large. Anthers yellow, Ovary u.s., with 5 styles, connate at the base. Fruit small or large depressed or umbilicate at the base, pulp acid, harsh, or sweet, without hard concretions at the core. (S) Central and South Europe, Western and Central Asia as far as Siberia; widely cultivated in the temperate regions. March-May. *Malta* and *Gozo*. Cultivated, very rarely met with self-sown.-*Malus communis Poir.* E. Apple. I. Pomo, Melo. M. Tuffieh ta Billudja.

The variety: *silvestris L-Malus acerba Merat-Pirus acerba D.C.*, with roundish oval leaves, shortly acuminate, shining, glabrous, green on the lower surface, bearing small, subglobose harsh fruit, is occasionally cultivated as stock for grafting the cultivated apples. E. Crab. M. Tuffieh salvagg.

The variety: *dasyphylla Bluff et Fing.-Malus dasyphylla Borkh.-Pirus Malus v. tomentosa Koch*, has oval-oblong or obovate leaves, acuminate, more or less

hairy and tomentose on the lower surface, and fruits of variable size and colour. The cultivated apples belong to this variety, to which belongs also the wild apple, used for grafting and known as paradise-stock, bearing small, subglobose or depressed, yellow, acidulous fruits.

The Apple is not a native of these Islands. The name (Tuffieha) is generic for swollen fruits, and the nickname (ta Billudja), a contraction of (Bur il-Ludja), the country of the foreigners or heathens, refers to its foreign origin.

PIRUS AUCUPARIA Ehrh. A shrub or tree, 2-10 m. high. Leaves with 5-13 leaflets, lanceolate or oblong, acutely serrated except at the base, glaucous on the under surface; slightly hairy when young and entirely glabrous when adult. Stipules linear, caducous. Bud mostly tomentose but not viscid. Flowers in large dense corymbs, with applied hairs or glabrous; small, white. Teeth of calyx incurved after flowering; petals obovate. Styles usually 3; fruit about 1 cm. in diameter, deep red, acid and bitterish, globular. (S) Europe, Central and Northern Asia. April-May. *Malta*, very rare, in single specimens at Wied Encita and Hal Far.-*Sorbus Aucuparia* L. E. Mountain Ash. I. Sorbo degli uccellatori, Sorbo Selvatico.

PIRUS DOMESTICA Ehrh. A shrub or tree, 3-8 m. high. Leaves with 5-13 oval-lanceolate leaflets, entire at the base, and partly on the sides, acutely serrated for the rest, more or less hairy even when adult. Inflorescence at first cottony and woolly, with large dense corymbs. Flowers white, larger than in the preceding species. Teeth of calyx reflexed after flowering; petals obovate. Styles 3-5. Fruit large, pyriform or globular, 2-4 cm. in diameter, reddish yellow, and then purplish brown, and sweet at perfect maturity. (S) South Europe; naturalised elsewhere. April-May. *Malta* and *Gozo*, cultivated here and there: naturalised in certain places in Malta, as at Wied Lunziata near Dingli, in certain gardens at Attard etc., freely suckering. E. Service-tree. I. Sorbo, Sorbo domestico. M. Sorba or Zorba.-*Sorbus domestica* L.-*Pirus Sorbus* Gaertn.

## ORD. LEGUMINOSAE.

### CAESALPINIACEAE.

Trees, shrubs or woody perennials. Leaves alternate, generally compound. Stipules deciduous or persistent or spinescent. Flowers more or less sygomorphic, hermaphrodite, rarely dioecious or polygamous, with an imbricate aestivation, in racemes or spikes or axillary clusters. Calyx usually of 5 segments. Corolla of 5 petals, inserted on the calyx, rarely reduced to 3-1 or wanting. Stamens 10 or less, inserted with the petals, with more or less unequal filaments, usually free, rarely coherent. Carpel solitary with several ovules. Fruit a legume, dehiscent or indehiscent, sometimes divided

transversely by false septa like a lomentum. Embryo straight, with or without albumen.

The family includes 36 genera, with about 250 species, natives of tropical and subtropical countries.

*Ceratonia Siliqua* is the well-known Carob tree producing a sugary indehiscent pod largely used as food for horses. *Copaifera officinalis*. *C. coriacea*, *C. cordifolia* etc., yield an oil resin called balsam of Copaiba, used in medicine. The varnish called copal is the produce of *hymenaea verrucosa* of Madagascar. The pulpy indehiscent pod of *Tamarindus indica* of India is the well known Tamarind used in hot climates as a laxative and for refreshing drinks. *Myroxylon toluiferum* and *M. peruiferum* of Central and South America yield the Tolu and Peru Balsams used in medicine. *Caesalpinia Sappan*, frequently cultivated in our gardens yields the very hard red Sappan wood of India and Ceylon. *Cassia fistula* yields the long woody Cassia pods which contain a black sugary pulp with laxative qualities. *Cassia obovata*, *C. acutifolia*, *C. lanceolata* and other species yield the Senna leaves and Senna pods very commonly used as laxatives.

#### CERATONIA L.

Flowers polygamous-dioecious, in lateral racemes springing in clusters from the old wood. Calyx with a very short tube, discoidal, with 5 tooth-like deciduous segments. Corolla wanting. Stamens 5, with long protruding and spreading filaments. Ovary rudimentary in the male flowers, shortly stipitate in the other flowers. Style short with a peltate stigma. Legume large indehiscent, compressed, reddish brown with a coriaceous epicarp, and a sugary soft mesocarp forming false dissepiments between the seeds. Seeds obovate, compressed, very hard. Includes only one species.

**CERATONIA SILIQUA L.** A thornless, evergreen spreading tree or shrub, with a dense head of foliage, 2-12 m high. Leaves paripinnate, with 2-5 pairs of shortly petiolate leaflets, broadly oval, entire or emarginate, coriaceous, glabrous, of a dark shining green. Stipules small, deciduous. Flowers small, shortly peduncled, with hairy calyx and ovary, emitting a disagreeable scent. Legumes stipitate, glabrous, reddish brown, straight or more or less curved on their sutures which are thickened and rounded. (S) Greece, Crete, Grecian Archipelago, Cyprus, Asia Minor and Syria; cultivated and extensively naturalised in all warm countries washed by the Mediterranean. October-November. Common on rocky ground and on red soils in *Malta*, *Gozo* and *Comino*. This tree with its dark green foliage imparts a peculiar feature to our landscape, and is most abundant in Malta in the district between Birchircara, Naxaro and Sliema, and again from Imkabbia to Birzebbugia. It is mostly self-sown or wild, and then budded with a choice variety; male trees are occasionally allowed to remain unbudded for a supply of male flowers for cross-pollination, which is generally practised by placing small clusters of male flowers on the fork of a branch of a fruit-bearing tree. E. Carob, St. John's bread, Locust tree. I. Carrubo. M. Harruba. The pods are valuable as

food for horses, and were formerly eaten by the poorer people in times of scarcity.

## PAPILIONACEAE.

Trees, shrubs and herbs, perennial or annual, often twining or climbing, and often with tubercles on the rootlets due to the presence of symbiotic nitrogen-fixing bacteria. Leaves alternate, compound, imparipinnate or paripinnate and then often terminating in a tendril; or wanting and replaced by leaf-like stipules, or by decurrent wings on the stem; rarely simple by reuction. Flowers zygomorphic, very generally hermaphrodite, axillary, solitary or in small clusters or umbels or in racemes or spikes. Calyx monosepalous, irregular, 5-toothed or 5 cleft, and often bilabiate. Petals usually 5, or less by reduction, inserted on the base of the calyx, free and unequal, rarely coherent at the base, usually forming the typical papilionaceous corolla; the posterior petal or standard embracing the others, and the two lateral or wings including the two anterior which together form the keel and are often connate. Stamens 10, or less by abortion, monodelphous, or didelphous by the separation of the stamen opposite the standard, or free, inserted with the petals. Ovary solitary, sessile or stipitate, hairy when young, usually with several ovules. Ovules campylotropous, inserted in two rows along the suture opposite the standard. Style filiform. Legume one-celled with two valves, or divided into two cells by a false septum, or divided by false transverse septa into as many cells as there are seeds, forming a lomentum or jointed indehiscent pod, breaking of into one-seeded joints. Seeds carunculate, with or without albumen.

This is one of the largest families and includes the greater number of the Leguminose order comprising 390 genera, with over 6,700 species.

The Papilionaceae include many species largely cultivated as food for men and animals, such as *Phaseolus vulgaris* (the Frech bean), *Phaseolus lunatus* (Lima bean), *Vicia Faba* (Broad bean), *Pisum sativum* (Pea), *Cicer arietinum* (chick-pea), *Vicia* (*Ervum*) *Lens* (the Lentil), *Arachis hypogaea* (pea-nut or earth-nut), *Soja hispida* (Soy bean), *Vicia sativa* (Vetch or Tare) *Lathyrus Ochrus* etc. Other are chiefly used as forages, green or dry, such as *Trifolium pratense*, *T. alexandrinum*, *Hedysarum coronarium*, *Onobrychis sativa*, *Scorpiurus subvillosus*, *Lathyrus sativus*, *Medicago sativa* etc. Some species are very poisonous, such as *Physostigmat venenosum* (Calabar bean), and the native *Anagyris foetida*; other species cause poisonous symptoms which may prove fatal to domestic animals, such as *Vicia* (*Ervum*) *Ervilia*, the bitter vetch, which is poisonous to pigs and *Phascolus lunatus* which in a green state or uncooked may contain hydrocyanic acid. A few species are used in medicine such as the roots of *Glycirriza glabra* and *G. echinata* (Liquorice), the leaves of *Colutea arborescens* (Bladder Senna) used as purgative, *Spartium junceum* (Spanish broom) is the source of sparteine a powerful diuretic, and *Physostigma venenosum* yields the alcaloid physostigmine used for contracting the pupil in certain eye-diseases.

## ANAGYRIS (TOURN.) L.



Flowers in short clusters or racemes. Calyx 5-toothed, persistent. Corolla with obcordate standard, oblong wing, and keel with free petals twice as long as the standard. Stamens free. Style filiform and straight. Legume large, stipitate, linear oblong and compressed, with false transverse septa and large hard reniform seeds. Species 2, one of which special to the Canary Islands.

**ANAGYRIS ROETIDA L.** A deciduous shrub, 1-3 m. high, very branched and woody, thornless, foetid. Young shoots pubescent, commencing development late in autumn. Leaves petiolate, ternate, with sessile leaflets, oval or laceolate, asy green, entire, pubescent on the lower surface. Flowers pedunculate, borne on the old wood, in clusters or racemes leafy at the base, with pubescent calyx brownish green with greenish yellow corolla having a dark brown spot on the standard. Stipules connate into one, opposed to the leaf and bifid at the apex. Legumes pendulous, smooth, undulant. Seeds violet. (S) Mediterranean region as far as Arabia. December-February. *Malta*, rare, at Wied il Ghasel, Wied il Madliena, Bahria, Imtahleb Boschetto, Wied il Luk, Wied Kirda, Imtarfa. E. Stinking Bean Trefoil. I. Anagiride, Laburno fetido. M. Fula tal Clieb. The seeds are very poisonous.

Form: neapolitana Ten. Standard of corolla without dark brown spot; seeds yellow. With the species at Boschetto Imtarfa and Imtahleb.

**CERCIS SILIQUASTRUM L.** A deciduous tree or shrub, with orbicular foliage and clusters of deep pink flowers produced on old wood before the foliage, native of Southern Europe, and frequently cultivated for ornament, is met with naturalised in the Boschetto Gardens.

#### SPARTIUM (Tourn.) L.

Flowers in small axillary clusters along the younger twigs. Calyx persistent, oblique, short, cleft superiorly, with 5 small teeth. Corolla large, with apiculate standard; the keel being acute, with its two petals connate at the base. Stamens monodelphous. Style filiform, curved, with the stigma villose on the inner side. Legume erect, linear compressed, as first pubescent and then almost glabrous, with many seeds. Includes only one species.

**SPARTIUM JUNCEUM L.** A thornless, very branched, and practically leafless shrub, 1-3 m. high, with green rush-like erect branches, pubescent when young, and scabrous when older. Leaves simple, linear or elliptical, subsessile, few in summer and easily deciduous. Flowers singly or in small clusters, on short peduncles, large, sweet-scented. Calyx scarious and smooth. Corolla golden yellow, smooth except on the lower margin of the keel; wings shorter than the keel and the standard, Legume 4-8 cm. long, dark brown, with thick valves; seeds ovoid, reddish brown. (S) Mediterranean region and the Canaries. April-May. *Malta*, very rare, on the rocks below the Inquisitor's Palace (Ghain il Cbira), and at Boschetto, Gozo, Imgiar ix-Xini on a slope of rocky ground at the lower end of the valley. It is also cultivated for ornament-*Genista juncea* Scop. E. Spanish Broom. I. Ginestra, Maggio. M. *Genista safra*.

## ONONIS L.

Herbs annual or perennial, sometimes woody and shrubby. Leaves 1-3 foliolate; stipules connate with the petiole. Flowers axillary, solitary or geminate, sometimes racemose. Calyx campanulate, 5 toothed. Petals all free; standard roundish, keel acute or rarely obtuse. Ovary usually with few ovules. Style curved or elbowed. Legume oval or oblong-linear, always dehiscent. Species about 60, natives of Europe, Western Asia, North Africa and the Canaries.

**ONONIS MITISSIMA L.** An annual plant with an erect or ascending stem, ramified from the base (1-5 dm.), hairy and glandular. Leaves with a short petiole, trifoliate, with elliptical or oblong leaflets, acutely serrated, pubescent and glandular. Stipules oblong and toothed. Lower floral leaves 3-foliate, the upper 1-foliate, the uppermost reduced to the stipule. Stipules of floral leaves broad, whitish or scarious, smooth, enclosing the calyx. Flowers subsessile in spike-like dense ovate or cylindric racemes. Calyx tubulose campanulate, whitish, smooth, with ovate-acuminate, ciliated teeth. Corolla slightly longer than the calyx, white, with a purple standard. Legume subequal to the calyx, ovoid, hairy and glandular, with 2-3 seeds. (A) Mediterranean region Canaries, Madeira. April-June. *Malta*, rather rare, Boschetto, Gneina, Wied il Calcara, St Paul's bay, melleha, Birzebbugia, mostly on sandy and clayey soils. Gozo, also scarce, at Marsalforno and Xlendi. *Comino*, Kala Sta. Maria.

**ONONIS ALBA Poir.** Plant more or less hairy, glandular and clammy, annual and herbaceous, 2-5 dm. high; with semiovate, toothed, leafy stipules, and one-foliate leaf, with leaflet acutely toothed. Flowers axillary, in loose racemes, Calyx campanulate, with acute lanceolate teeth. Corolla about as long as the calyx, or slightly longer, hairy on the outside, white, light pink or flesh colour. (A) North Africa, Italy, Sardegna and Sicily. The typical form with oblong leaves, erect or ascending stem, and loose racemes on short pedicels, *-Ononis monophylla Desf.*, does not exist in the Maltese Islands. E. white-flowered Rest-Harrow.

**Var. oligophylla Ten.** Plant less hairy and glandular; stems prostrate or diffuse. Leaves small, roundish. Racemes dense, with longer pedicels. May-June. Gozo, rather rare: along the road Victoria-marsalforno, and at Xaghra, along the road from Xaghra to Nadur.

**ONONIS VARIEGATA L.** Plant annual very branched from the base, usually prostrate, stems 1-3 dm. long, hairy and glandular. Cauline leaves mostly with one small leaflet, leathery, subsessile, oblong or cuneate, toothed, with prominent nerves. Upper leaves reduced to the stipules, which are large, oval, amplexicaul and toothed. Flowers in loose racemes, on pedicels equal to the tube of the calyx. Calyx pubescent and glandular, with lanceolate teeth. Corolla twice as long as the calyx, yellow, with a pubescent standard. (A) S. Europe, North Africa, Asia Minor. April-May, *Malta*, very rare, at Marsascala. Gozo, on the rocky slope from Xaghra to Ramla.

**ONONIS NATRIX L.** A perennial plant, very pubescent and viscid, foetid, with an erect or ascending stem, much branched from the base, 2-5 dm. high. Leaves petiolate, the cauline trifoliate, the upper reduced to only one leaflet; leaflets toothed in the upper half. Stipules shorter than the petiole, entire, lanceolate-acuminate. Flower-stalks one-flowered and aristate, equal to or longer than the leaves. Calyx with lanceolate acuminate teeth 3-4 times as long as the tube. Corolla yellow, usually with the standard flaked purple. Legumes pendulous, linear, compressed, hairy and glandular, with several seeds. (P) Central and South Europe, North Africa, Asia Minor and the Canaries. I. Erba bacaja, M. Broxca. On rocky ground, especially near the sea. *Malta*, frequent at Melleha and Marfa, less frequent elsewhere. *Gozo* and *Comino*, abundant in many places, as at Chambray, Nadur, Ta Cenc, Dabrani, ta harrax, etc. The form concolor Rouy, with the standard self-coloured yellow, is frequent with the species at Chambray and Dabrani in *Gozo*. E. Goat-root, yellow Rest-Harrow. M. Broxca.

Var. *ramosissima* Desf. Plant more vigorous and more thickly branched, with narrower leaflets and stipules, and smaller flowers. Frequent with the species, in *Malta*, *Gozo* and *Comino*, often replacing it entirely.

**ONONIS ORNITHOPODIOIDES L.** An annual plant, pubescent and glandular, with erect stems branched from the base, 5-25 cm, high. Leaves all trifoliate, the radical being one-foliate, with leaflets oval or oblong and cuneiform and toothed. Stipules ovate-acute, shorter than the petiole. Flower-stalks one to two-flowered, aristate, and about as long as the leaf. Calyx with linear teeth, 5-6 times as long as the tube. Corolla yellow, as long as the calyx. Legumes pendulous, linear, compressed, torulose, curved and hairy, with 8-10 seeds. (A) Mediterranean region. March-May. *Malta*, Wied il Ghasel, Verdala Park and Boschetto, Ta Laurenti, Hark Hamiem, Madliena, Wardia *Gozo*, Ras il Kala, Marsalforno, Xlendi. *Comino*, frequent on rocky ground around Kala Sta. Maria.

**ONONIS SIEBERI Bess.** Plant annual, villose with long white hairs and with shorter glandular hairs, branched from the base, 1-3 dm. high. Radical and uppermost leaves with one leaflet, the others trifoliate; leaflets oval or oblong, toothed, pubescent and glandular. Stipules entire, ovate-lanceolate. Flower-stalks equal to the leaf, or longer, one-flowered, not aristate. Calyx with broadly lanceolate teeth, 3 times as long as the tube. Corolla yellowish pink, equal to the calyx or slightly longer. Legumes pendulous, oblong. Subequal to the calyx, hairy, with 4-6 seeds. (A) Italy, Sicily, Sardegna, Lampedusa, Greece, Candia. March-June. Frequent in fields and uncultivated ground, in *Malta*, *Gozo* and *Comino*, - *Ononis pendula* Sieb. Non Desf.-O. polymorpha Guzz.

**ONONIS BIFLORA Desf.** An annual plant, slightly pubescent and glandular, more or less erect and branched, 2-5 dm. high. Leaves except the radical, all trifoliate, with oblong leaflets, toothed. Flower-stalks equal to the leaf or longer, with an awn as long as the pedicel, one or two-flowered. Calyx with very narrow lanceolate teeth, twice as long as the tube. Corolla twice as long

as the calyx, very pale yellow often flushed or striated with pink. Legume pendulous, briefly stipitate, 3-4 times as long as the calyx, with 12-14 seeds. (A) Spain, Italy, North Africa, Cyprus, Syria and Mesopotamia. *Malta*, rather rare, Wied il Calcara, Ghirghenti, Corradino, cottonera, Geina, Marsascala, Ramla ta Maroc. Gozo, also scarce, Xeuchia and Imgiar ix-Xini.-*Ononis praecox* Bianca. The form with striated flowers is *Ononis bicolor* Moris. E. Two-flowered Rest-Harrow.

**ONONIS RECLINATA L.** An annual plant, erect and branched from the base, with lower branches almost decumbent, greyish green and softly pubescent in all its parts, (5-25 cm.). Lower leaves trifoliate, floral leaves with only one leaflet. Leaflets obovate cuneate, often almost linear, more or less hairy. Stipules about as long as the petiole, toothed or entire. Flowers in terminal leafy racemes, on one-flowered stalks shorter than the leaf. Calyx with linear-lanceolate teeth, 3-4 times as long as the tube. Corolla equal to, or shorter than the calyx, white with a light pink standard. Legume longer than the calyx, oblong-cylindrical, hairy. (A) Mediterranean region as far as Abyssinia, England, Canaries, Madeira. April-May. Frequent on rocky and uncultivated ground, and often in fields, in *Malta*, *Gozo*, *Comino* and *Cominotto*.-*Ononis laxiflora* Viv.

Var. *mollis* Savi.-Var: *minor* Moris. Corolla shorter than the calyx. Leaves narrower or linear. Legume hardly longer than the calyx. With the typical form, and more frequent in arid and exposed situations. E. Small Rest Harrow.

## MEDICAGO (Tourn.) L.

Herbaceous plants mostly annual or prostrate, rarely suffruticose and shrub-like, with trifoliate leaves, and with stipules connate with the petiole. Flowers small, in axillary racemes, few-flowered, or many-flowered and dense, forming a head. Calyx shortly campanulate with 5 subequal teeth. Petals distinct, keel obtuse. Ovary with many ovules, rarely with only one or two. Legume generally helicoid, or twisted spirally, rarely crescent-like, indehiscent more or less tuberculate or spinous, rarely with smooth margin. Species about 46, mostly natives of the Mediterranean region as far as Central Asia; a few are natives of North and Central Europe and South Africa: naturalised elsewhere.

**MEDICAGO LUPULINA D.C.** Plant usually with perennial rootstock, more or less ashy green and pubescent with short adpressed hairs, very branched from the base, with prostrate stems (1-6 dm.) Leaflets obovate roundish or rhomboid, slightly toothed above, with entire or toothed stipules. Flowers very small, yellow or light yellow, in dense racemes or heads, on axillary peduncles longer than the leaf. Legumes small, hardly exceeding 2mm in length, unarmed, glabrous or pubescent. (A)-(P) Europe, North Africa, Central Asia, Abyssinia, Canaries, Azores; naturalised elsewhere. March-May. Frequent on uncultivated and rocky ground, along walls of fields etc. in *Malta* and *Gozo*. E. Black Medick, yellow Clover.

Var. *Cupaniana* Guzz. Keel and wings twice as long as the teeth of calyx. Legumes glandular, or more or less glabrous, easily breakable from their pedicel. Frequent with the species, or replacing it, at Boschetto, Verdala Park, Ta Laurenti, Dingli, Ghirghenti, Wied Encita etc. in Malta. Probably also in Gozo.-*Medicago apennina* J. Woods.-m. *Willdenowii* Guss.

**MEDICAGO ARBOREA L.** An erect branched shrub, 1-2 m. high, deciduous in summer, covered with a silvery or ashy green pubescence. Leaves densely inserted on short lateral twigs: leaflets obovate or obcordate, entire or slightly toothed above. Stipules entire, lanceolate. Flowers large, golden yellow, in head-like racemes, on a stalk equal to or longer than the leaves. Legumes membranous, unarmed, coiled spirally 1 or 1½ times, glabrous or hairy. (P) Native of Asia Minor and Greece, naturalised elsewhere. Cultivated for ornament, and naturalised in the Addolorata Cemetery and Boschetto. E. Moon Trefoil, Tree Medick.

**MEDICAGO MARINA L.** A perennial plant with deep tap-root and prostrate or decumbent annual stems, thickly tomentose and silvery green. Leaves densely inserted, with obovate or obcordate leaflets, crenated above. Stipules broadly lanceolate, acuminate, almost entire. Flowers rather large and showy, golden yellow, in dense racemes of 5-12 flowers, on a stalk about as long as the leaf. Legumes discoidal or cylindrical, coiled twice or thrice, dextrorse, tomentose, with an obtuse margin usually provided with tubercles or short spines. (P) Mediterranean region and Western France. April-May. Frequent on sandy shores. *Malta*, Ahrax, Melleha, Gneina, Marsascirocco, Ramla ta San Tumas. *Comino*, Kala Sta. Maria. E. Bur Medick.

**MEDICAGO SCUTELLATA (L) Mill.** An annual plant, pubescent and glandular, with an erect or ascending stem 1-5 diameter). Lower leaflets obovate, the upper oblong, toothed for their upper half. Stipules ovate and toothed. Flower-stalks with 1-3 flowers, much shorter than the leaf. Teeth of calyx longer than the tube, and hairy. Legumes dextrorse, unarmed, coiled 5-6 times, hairy, with an acute margin, obliquely veined and reticulated. (A) Mediterranean region and South Russia. March-May. *Malta*, at Melleha; *Comino*, according to Gulia. A very rare species, mentioned only by Gulia-*Medicago polymorpha* var: *scutellata* L. E. Barbary Buttons, Snails.

**MEDICAGO ORBICULARIS (L) All.** Plant annual, glabrous or slightly pubescent, with prostrate stems, 2-6 diameter long. Leaflets obovate or obcordate, toothed for their upper half almost glabrous. Stipules deeply toothed. Flower-stalks with 1-5 flowers, shorter than the leaf. Teeth of calyx longer than the tube, hairy at the base only. Legumes closely coiled 2 to 5 times, dextrorse, 10-18 mm. In diameter much more broad than long. Seeds minutely granulose, (A) Mediterranean region, Caucasus, India, Abyssinia, Canaries, Madeira. March-May. Common in fields of sulla and vetches, and on cultivated and uncultivated ground, in *Malta*, *Gozo* and *Comino*, -*Medicago polymorpha* var. *orbicularis* L.-M. *ambigua* Jord.

Var. *marginata* W. Legumes with coils far apart like a cork-screw. Frequent with the species in more shaded localities.

Var. *cuneata* J. Woods. Legumes with 6-9 coils, of a globular shape, that is the legumes becoming narrower at each extremity, with a thickened margin-form: *Biancae* Tod. With the species in fields of *sulla*, but less frequent. *Malta*, Ghain Mula, Ghain Rihana, Fiddien etc.

**MEDICAGO RUGOSA** Desr. An annual plant, pubescent and glandular, with prostrate or ascending stems (1-5 diameter). Leaflets obovate or rhomboid, pubescent on the lower surface, toothed for the upper half. Stipules toothed. Flower-stalks with 1-4 flowers, shorter than the leaf. Teeth of calyx equal to the tube. Legumes discoidal, dextrorse, glabrous or pubescent, coiled twice or thrice with thick flat coils, markedly rugose along the margin. (A) Italy, Sardegna, Corsica, Sicily, Grece, Asia Minor, North Africa. March-May. Frequent in *Malta* and *Gozo*, in fields and on uncultivated ground.-*Medicago elegans* Jacq.

**MEDICAGO OBSCURA** Retz. Plant annual, with prostrate or ascending stems, hairy or hirsute above, 1-5 diameter long. Leaflets obovate or rhomboid, toothed in their upper half. Stipules laciniate. Flower-stalk 1-5 flowered, equal to or longer than the leaf. Teeth of calyx longer than the tube. Legumes lenticular, unarmed or tuberculose, coiled once or twice, glabrous dextrorse or sinistorse, with 1 or 2 seeds, (A) South Europe, North Africa, Canaries and Madeira. March-April. Rather rare; in fields and uncultivated ground. *Malta*, Corradino, Wied Gherzuma. *Gozo*, Wied il Lunziata. The form with unarmed legumes, dextrorse or sinistorse, is *M. levis* Desf.

Var. *helix* Willd. Legumes lenticular, usually sinistorse, unarmed, or armed with setaceous spines or tubercles (form. *Spinosa* Guss.) With the type, but rarer.

Var. *muricata* urb. Legumes cylindrical, with 4-8 coils, dextrorse or sinistorse, with slender spines. *Medicago muricata* Willd.-*M. commutata* Tod.

**MEDICAGO TUBERCULATA** Willd. An annual plant, with prostrate or ascending stems, pubescent, 1-5 diameter long. Leaflets u.s., pubescent on both surfaces. Stipules toothed or laciniate. Peduncles with 1-8 flowers, furnished with an awn, and about as long as the leaf. Teeth of calyx longer than the tube, very hairy. Legumes truncated at the base, convex at the apex, oval-cylindrical, glabrous, with 5-8 coils, having an acute margin which later on is hidden by the thickened base of short spine-like tubercles. (A) mediterranean region. March-April. *Malta*, in fields and uncultivated ground: Wied Gherzuma, St. Paul's Bay, Wardia, Puales, Bahria etc. *Gozo*, more frequent, in many localities.

**MEDICAGO TRUNCATULA** Gaertn. Plant annual, with prostrate stems, hairy above, 1-6 diameter long. Stipules laciniate. Leaflets obovate, obcordate or rhomboid, hairy on the lower surface, and margin acutely toothed near the apex. Peduncles shorter than the leaf, usually 1-3 flowered, furnished with an awn. Calyx with pubescent teeth longer than the tube. Legumes cylindrical or globulose, glabrous or somewhat pubescent, with 4-5 coils, and not more than

7 mm. in diameter, coils with a keeled dorsal margin with a deep furrow on each side. (A) Mediterranean region, Canaries, Madeira. March-May. Common in *Malta*, *Gozo* and *Comino*, in fields, valleys, and on uncultivated ground.

Var. *tentaculata* Willd. Legume sinistrorse or dextrorse, with spines hardly as long as the thickness of the coils, and at maturity prostrate or applied to the coil.-*Medicago tribuloides* var: *breviaculeata* Moris. With the species, and often replacing it.

Var. *tribuloides* Desr. Legume sinistrorse or dextrorse: spines longer than the thickness of the coil, erect or applied to the legume. With the species but much less frequent-M. *truncatula* b. *longeaculeata* Urb.

MEDICAGO LITORALIS Rohde. Plant annual, glabrous or pubescent, with prostrate stems 1-4 diameter long. Leaflets obcordate or obovate; stipules laciniate. Peduncles longer than the leaf, 1-4 flowered, furnished with an awn. Legume cylindrical or discoidal or truncated at the base, glabrous, small, not exceeding 6 mm. in diameter (A) Mediterranean region, Canaries, Madeira. Common in fields, gardens, valleys and on uncultivated ground in *Malta*, *Gozo*, *Comino* and *Cominotto*.

Var. *inermis* Moris. Legumes unarmed or with small tubercles, dextrorse or sinistrorse, with not more than 4 coils, more broad than long.- form: *tricycla* D.C.-*Medicago striata* Bast. With the species.

Var. *breviseta* D.C. Urb., Legumes with thorns not longer than the thickness of the coil. Legume more long than broad (form: *cylindracea* D.C.) or more broad than long (form: *depressa* urb) *Malta*, with the species.

Var. *longiseta* D.C., urb. Thorns of legumes longer than the thickness of the coils. Legumes more broad than long, with 3-4 coils form: *arenaria* Ten.) Frequent on uncultivated ground and fields close to the sea or in sandy localities in *Malta* and *Gozo*.

MEDICAGO TURBINATA (L) Willd. Plant annual, pubescent or hirsute, with prostrate or ascending stems, 1-5 diameter long. Leaflets hairy on both surfaces, obovate or rhomboid, toothed above. Stipules toothed. Peduncles awaless, 1-2 flowered, usually much longer than the leaf. Teeth of calyx longer than the tube, entirely hirsute. Legumes globose or oval-oblong, hairy when young, with 5-7 thick coils (A) South Europe and North Africa. March-May. In fields and uncultivated ground. *Malta*, Marsascale, Cottonera, Boschetto, Wardia, Wied Bufula, Ghain Rihana Gozo, Ramla, Nadur, San Blas.

Var. *olivaeformis* Guss. Legumes oblong-oval, dextrorse, or sometimes sinistrorse, with short straight thorns. Replaces the species at Boschetto and Ghain il Cbira.

Var. *aculeata* (Gaertn.) Moris. Legumes more globular, sinistrorse or sometimes dextrorse, with longer thorns, often hooked at the end. Wied Bufula (Malta) and Ramla (Gozo).

MEDICAGO MUREX Willd. Plant annual, almost glabrous, with prostrate or ascending stems up to 9 diameter long. Leaflets obovate or oblong, hairy on the lower surface. Stipules laciniate. Peduncles terminating in an awn, 1-4 flowered, usually longer than the leaf. Teeth of calyx hairy, longer than the tube. Legumes armed or smooth, globose or ovate, glabrous, with 5-9 coils, with 2-3 nervatures along the outer margin. (A) Mediterranean region.

Var. *sphaerocarpa* Bert. Legume globose thorny, with 5-7 coils, with a diameter up to 7 mm., or (form: *macrocarpa* Moris with a diameter of 8-9 mm., or with very short thorns (form: *brevispina* Rouy). In fields and along country-roads and in valleys. *Malta*, Wied Encita, Imtahleb, Wied Babu, Ta Baldu, Wardia, San Martin etc; nowhere common.

MEDICAGO MINIMA Grub. In L. Plant annual, pubescent or velvety, with prostrate stems 5-35 cm. long. Stipules ovate, entire or toothed. Leaflets obcordate or obovate, toothed above, pubescent on both surfaces. Peduncles of 1-10 flowers, shorter or longer than the leaves. Teeth of calyx subequal to the tube. Legumes globose, with 3-5 coils having a narrow margin furnished with divergent thorns, glabrous or slightly hairy, dextrorse, not exceeding 5mm. in diameter. (A) Western and Central Europe, Mediterranean region as far as the Caucasus and India, Abyssinia and the Canaries; naturalised elsewhere. February-May.-*Medicago polymorpha* var. *minima* L.-M. *hirsuta* All. Common on uncultivated ground and along roads in *Malta*, *Gozo*, *Comino* and *Cominotto*. The typical form, with thorns not shorter than half the diameter of the legume and leaves thickly pubescent or ashy green, is more frequent along country roads, as at Attard, Rabato, Hemsia etc. e Bur-Medick.

Var. *recta* Willd. Thorns as long as the diameter of the legume, or longer. Leaflets obovate or cuneate-linear. Plant very pubescent or greyish tomentose. Frequent along roads, walls of fields, and on uncultivated ground in exposed situations, *Malta*, *Gozo* and *Comino*.-*Medicago polymorpha* var: *recta* Desf.-M. *minima* var. *longisetata* D.C.

Var. *hirsuta* L. Thorns shorter than the diameter of the legume, or almost wanting. Plant hirsute.-M. *minima* var *brachyodon* Rehb. In valleys fields and shaded localities; less frequent.

MEDICAGO TENOREANA Ser. in D.C. Plant annual, with stems erect or prostrate, hairy. Stipules u.s. Leaflets u.s. Peduncles shorter than the leaves, 1-3 flowered. Legumes cylindro-conical, dextrorse, smooth or somewhat hairy, with 3-5 coils having a flat margin and loosely applied, with long divergent thorns often hooked at the end. (A) South France, Italy, South Spain and Dalmatia. March-April. *Malta*, in exposed situations, at Gharghar, Corradino, Cottonera, according to Delicata and Gulia.-*Medicago cancellata* Ten. Non M.B.



MEDICAGO ARABICA (L). All Plant annual, with prostrate stems, 2-6 diameter long, furnished with jointed hairs. Stipules toothed, leaflets broadly obovate or obcordate often spotted black. Peduncles shorter than the leaf, 2-5 flowered. Legumes globose-depressed, almost flat at both ends, dextrorse, glabrous, usually with 3-5 coils having a broad margin with three furrows, and armed with arcuate or reflexed thorns, not hooked at the end. (A) Central Europe, Mediterranean region as far the Caucasus: naturalised in North America. February-May. Rather rare: *Malta* at Ghain il Gbira and Melleha; *Gozo* at Xlendi.-*Medicago polymorpha* var: *arabica* L.-*M. maculata* Sibth.

MEDICAGO HISPIDA Gaertn. Plant annual with erect or prostrate stems, 1-6 diameter long, glabrous or slightly hairy. Stipules laciniate. Leaflets broadly obovate or obcordate, rather small, and without sports. Peduncles subequal to the leaf, 1-8 flowered. Flowers with a short keel. Legumes discoidal or cylindrical, prominently veined, with an acute margin bearing a furrow on each side: thorns divergent, and often hooked, but not interlocked. (A) Central and south Europe, North Africa, Central Asia and Caucasus, Abyssinia, January-June. Common in fields, gardens, valleys, along roads and on uncultivated ground in *Malta*, *Gozo* and *Comino*.- *M. polycarpa* Willd.

Var. *denticulata* Willd. Thorns much longer than the thickness of the coil, usually hooked at the end. Legumes 4-6 mm. in diameter, coiled  $1\frac{1}{2}$  to  $3\frac{1}{2}$  times. With the species, very common everywhere.-*M. flexuosa* Ten.-*M. gracillima* Ten.

Var. *lappacea* D.C. thorns u.s. Legumes 7-10 mm. in diameter, with  $1\frac{1}{2}$  to 4 coils. With the species, in fields of barley and sulla, and in gardens and valleys.

Var. *nigra* Willd. Thorns u.s. Legumes u.s. with 4 to 6 coils, more closely coiled. With the species in fields and valleys, but much less frequent. — *Medicago Hystrix* Ten.-*M. pentacycla* D.C. non Guss.

Var. *apiculata* Willd. Thorns usually not hooked at the end, and about as long as the thickness of the coil, or much reduced. Legumes 4-6 mm. in diameter, with  $1\frac{1}{2}$  to 4 coils. With the species, and as frequent.

Var. *Terebellum* Willd. Thorns u.s. Legumes 7-10 mm. in diameter, with 4-6 or more coils. With the preceding variety but less frequent.

Var. *reticulata* Benth. Legumes practically thornless, 4-6 mm. in diameter, with 5-6 coils. With the species in fields of sulla etc. but very scarce.

MEDICAGO INTERTEXTA (L) Mill. Plant annual, glabrous usually robust, with prostrate stems, 1-6 diameter long. Stipules toothed or laciniate. Leaflets obovate or rhomboid, rarely obcordate, toothed for their upper half. Peduncles equal to the leaves or shorter, with 1-3 flowers. Flowers 5-8 mm long. Teeth of calyx subequal to the tube. Legumes dextrorse, glabrous,

thorny, with a flat or depressed margin. (A) South Europe, North Africa and the Canaries. March-May.-*Medicago polymorpha* var: *intertexta* L.

Var. *Echinus* D.C. Thorns longer than the thickness of the margin of the coil. Legumes globose or oval, with 7-9 coils, having a thick margin, with thick long thorns, arcuate or reflexed, interlocked, and closely applied to and covering the legumes-*Medicago Echinus* D.C. In fields and valleys, but not common. *Malta*, Wardia San Martin, Imtahleb, Gneina, Ghain Tuffieha, Wied Gherzuma, Ghain Mula, Pualet, Mistra; Gozo, at Wied il Lunziata, Ramla, Nadur. E. Calvary Clover, Sea-egg. Var. *Decandollei* Tin. Legume lenticular-depressed with 3-6 coils, with narrower margin and more slender thorns. With the preceding, at Wardia and Ghain Tuffieha, but rare.-*Medicago Decandollei* Tin.

*MEDICAGO CILIARIS* (L) Krock. An annual plant of the same habit of growth as the preceding. Legumes globose or more often ovoid, villose hirsute and with glandular hairs, with 6-10 coils having a thick flat margin. Thorns rather short, arcuate or reflexed, but not so closely applied nor interlocked as in the preceding species. (A) Mediterranean region, Canaries, Madeira March-May. *Malta* and Gozo, usually in the same places as the preceding species, and often more common, being found in many localities where *M. Echinus* does not occur. The medicago are called Medick or Lucerne in English, Erba Medica in Italian, and Nefel or Nefel Barri in Maltese.

#### *MELILOTUS* (Tourn.) Adans.

Herbaceous plants with trifoliate leaves, and with stipules adnate to the petiole. Flowers in spike-like axillary racemes, often sweet-scented especially when dry. Calyx and corolla as in *Medicago*. Ovary with few ovules. Legume a globose or ovoid, almost indehiscent nutlet with one, rarely 2-4 seeds. The valves of the legume are coriaceous or membranous, rugose or reticulate. Species about 20, natives mostly of the temperate regions of Europe, Asia and Africa, north of the equator.



**MISSING:**  
**All Melilotus**

TRIGONELLA FOENUM-GRÆCUM L. Plant annual, slightly hairy, emitting a strong odour of coumarine when dried, and communicating the same odour and flavour to the milk of animals feeding upon it. Stems erect, simple or branched from the base, 3-8 diameter high. Leaflets oblong-obovate, slightly toothed above, with entire ovate-lanceolate stipules. Calyx with 5 hirsute teeth, subequal to the tube. Corolla twice as long as the calyx, white and afterwards pale yellow, with the apex of the keel purplish blue. Legumes almost glabrous, linear somewhat compressed, slightly falciform, with veins longitudinal and reticulated. Seeds yellow, strongly scented. (A) Native of Western Asia; cultivated, or naturalised elsewhere. April-May. Sometimes cultivated or self-sown in fields and gardens. *Malta*, Ghirghenti, Siggieui. The seeds are a supposed cure for diabetes and externally act as an emollient. I enugreek, I. Fieno-greco, M. Helba, Fienu.

TRIGONELLA MONSPELIACA L. Plant annual, hairy especially in its upper parts, with prostrate or ascending stems 5-25 cm. long. Stipules linear-lanceolate. Flowers in small umbels, sessile or on a very short peduncle, with 6-18 very small flowers. Teeth of calyx linear, about as long as the tube. Corolla yellow, slightly longer than the calyx. Legumes divergent radiating like a star, 6-14 mm. long, linear, compressed, with transverse oblique nerves. Seeds cylindrical. (A) Mediterranean region, and from Switzerland across the Danube and South Russia to the Caucasus. March-May. *Malta*, frequent in exposed and dry situations, Musta San Paul tat-Targia, Misrah Ghonok, Boschetto, Marfa, Corradino, Pembroke Camp, Bugibba, Ahrax, etc. Gozo, Nadur, Xaghra, Gran Castello, etc. *Comino* and *Cominotto*.

TRIGONELLA MARITIMA Del. Plant annual glabrous or hairy above, with stems prostrate all round, 5-20 cm. long. Stipule toothed or lacinate. Leaflets fleshy, obovate-cuneate, or obcordate, obtusely toothed. Flowers 3 to 8, in small axillary umbels, on peduncles as long as the leaf, or shorter, and terminating in an awn. Teeth of calyx triangular-lanceolate, shorter than the tube. Corolla yellow, twice or thrice as long as the calyx. Legumes reflexed, linear, compressed, arched, acute, 10-12 mm. long, glabrous or hairy, with very oblique nerves. (A) North Africa, Italy, Syria. *Malta*, rare, in exposed sea-side places, at Sliema and Bieb il Gzira.-*Trigonella litoralis* Guss.

TRIGONELLA CORNICULATA L. Plant u.s. Stems erect or ascending 1-4 diameter high. Leaflets of lower leaves obovate, of the upper leaves oblong or lanceolate, toothed above. Flowers 8-20, in short racemes on peduncles shorter than the leaves and furnished with a short awn. Teeth of calyx lanceolate, unequal, shorter than the tube. Legume reflexed, 10-15 mm. long-compressed, falciform acuminate, glabrous, transversely nerved. Seeds oblong. (A) South France, Italy, Sicily, the Balkan Peninsula, Asia Minor and Cyprus; naturalised elsewhere. March-May. *Malta*, very rare. Wied Babu and Marsascala, according to Delicata and Gulia.

#### TRIFOLIUM (Tourn.) L.

Herbs with entire stipules adhering to the petiole. Leaves 3-digitate, that is ternate, rarely 3-foliate. Flowers axillary in dense heads, spikes or umbels,

rarely solitary or geminate. Calyx campanulate or urceolate-tubulose, with 5 teeth often unequal. Petals adhering to the staminal tube, with oblong or guitar-shaped standard, and an acute keel usually shorter than the wings. Stamens often flattened near their insertion with the anthers. Ovary with 1-6 ovules. Legume enclosed in the calyx or in the persistent and marcescent corolla, usually with one or two seeds, rarely more, indehiscent or dehiscing along the ventral suture. A large genus including about 250 species, broadly distributed in the temperate and subtropical regions of the northern hemisphere, only a few being found in South America and at the Cape of Good Hope.

**TRIFOLIUM SUBTERRANEUM L.** Plant annual, more or less hirsute or villose, with prostrate stems 1-3 dm long. Leaves furnished with a long petiole, ternate, with small leaflets obcordate or obovate hairy on both sides, slightly toothed above, with semioval acute or acuminate stipules. Flowers 2-7 in axillary heads on a peduncle subequal to the leaf, with a calyx having a smooth tube and linear ciliated teeth subequal to the tube. Corolla white, at least twice as long as the calyx. Besides the fertile flowers, there is in the centre of the head a clump of sterile calices which continue to grow after flowering and envelope the fertile maturing flowers. Legumes obovate compressed, crenated along the upper suture, protruding beyond the calyx, glabrous, one-seeded. (A) Mediterranean region. Western and Central Europe as far as the Caucasus, Canaries, Madeira. March-May. *Malta*, rather rare, but usually abundant in the places where it grows: Boschetto, Dingli, Naxaro, Saline, Ta Xbiex, fortifications of Valletta and Floriana. Gozo, at Kala and Gran Castello.

Var. *longipes* Gay. Stems very long and flaccid; peduncles 3-4 times as long as the leaf; stipules more acuminate. With the species and often replacing it.

Var. *brachycladum* Gib et Belli. Stems very short; peduncles very short. Tube of calyx often reddish and hairy. Plant more villose. With the species at Boschetto and at Gran Castello.

**TRIFOLIUM ARVENSE L.** Plant annual, erect, branched, usually pubescent or hirsute, 5-40 cm. high. Lower leaves furnished with a long petiole; upper leaves with short petioles and with oblong linear leaflets, toothed above. Stipules with long filiform apex. Flower-heads cylindrical, on axillary or terminal peduncles. Calyx densely villose with filiform teeth longer than the tube. Corolla flesh-coloured (A) Europe, Mediterranean Region, Caucasus, Abyssinia, Canaries. *Malta*, very rare, Corradino according to Delicata, Gneina and Melleha according to Gulia.

**TRIFOLIUM SCABRUM L.** Plant annual villose, with prostrate or ascending stems, 5-25 cm. long. Lower leaves with long petioles and obcordate or obovate leaflets, upper leaves with shorter petioles and obovate-rhomboid or oblong leaflets. Stipules ovate, terminating in a filiform apex; involucral stipules normal. Flower-heads ovate or obovate axillary or terminal, sessile, or with very short peduncles in vigorous plants. Calyx pubescent or hirsute, with triangular-lanceolate teeth equal to or longer than the tube, rigid, the

lower tooth reflexed. Corolla white or rosy, subequal to the teeth of the calyx, all petals connivent at the base with the staminal tube: calyx becoming obconical tubulose when in fruit (A) Mediterranean region, Central Europe, the Caucasus, Azores, Canaries. March-May. Common on exposed uncultivated ground, along walls of fields and in country roads, in *Malta*, *Gozo*, *Comino* and *Cominotto*.

Var. *lucanicum* Gasp.-*Trifolium dalmaticum* Delicata, Guss. Non Vis.-*T. scabrum* var *majus* Gib. Et Belli. Plant more erect and hairy. Flowers-heads ovate or almost cylindrical, rounded at the base. Teeth of calyx less rigid. Involucral stipules dilated. Corolla flesh-coloured and larger. In exposed situations: *Malta* Wied Ghomor, Sliema; *Gozo*, Ta Cenc.

**TRIFOLIUM LAPPACEUM L.** Plant annual, glabrous or slightly hairy, with spreading or ascending stems 5-30 cm. long. Stipules lanceolate-acuminate. Lower leaves furnished with a long petiole, upper leaves with shorter petiole, uppermost leaves opposed. Leaflets oblong or obovate, toothed at the apex. Flower-heads solitary, terminal, on long peduncles when in fruit, globose or oval. Calyx campanulate, with tube glabrous or rarely hirsute, with spreading subequal teeth, awn-like, ciliated, longer than the tube which has a hairy hardened ring at the throat. Corolla rosy white, not longer than the teeth of the calyx. (A) Mediterranean region, South Russia and the Caucasus, Canaries, Madeira, Azores. April-May. *Malta*, rather rare, on rocky uncultivated ground and along walls of fields, at Puales, Wardia, Wied Gherzuma, Melleha, Ghain Znuber, Wied il Ghasel, Imtahleb.

**TRIFOLIUM CONGESIUM Guss.** Plant annual, with short glabrous, prostrate stems, 3-8 cm. long. Leaves furnished with a long petiole. Leaflets obcordate, deeply toothed above, villose on both surfaces; stipules broad, short, triangular-acute. Flower-head axillary or terminal, sessile, enveloped by the uppermost stipules. Calyx with densely hairy tube and throat, with teeth subequal, awn-like, longer than the tube. Corolla white, subequal to the teeth of the calyx. (A) South Italy, Sicily and Greece. April-May. *Malta*, very rare, at Wied Ghomor and Cottonera, according to Delicata and Gulia.-*Trifolium catanense* Buek.

**TRIFOLIUM CHERLERI L.** Plant annual, hirsute, with stems densely villose, prostrate or ascending, 5-20 cm. long. Lower leaves with long petiole, upper leaves with shorter petiole, the uppermost sessile. Leaflets obcordate or obovate, toothed above. Flower-head globose-depressed, surrounded by the uppermost stipules which are rounded, much dilated, furnished with a short awn or awnless. Calyx villose, with obconical tube, and subequal teeth twice as long as the tube, filiform and plumose; throat of calyx villose, without callosity (A) Mediterranean region, as far as Mesopotamia, Canaries, Madeira. March-May, *Malta*, very rare, at Wied Babu and Marsascala; *Gozo*, at Wied il Lunziata. Not found against since Delicata and Gulia.

TRIFOLIUM STELLATUM L. An annual plant erect or ascending, softly villose in all its parts, 5-30 cm. high. Flower-heads solitary, globose or oval without involucreal stipules, on long peduncles. Calyx large, obconical, very villose, with nearly equal teeth, twice as long as the tube, broad at the base, acuminate, usually reddish on the inside, and spreading star-like when in fruit. Corolla white, pink or rarely yellowish, equal to the teeth of the calyx or slightly longer. (A) Mediterranean region, Caucasus, Canaries, Madeira. March-May. Very common on uncultivated ground, rocky wastes, valleys, country roads and along walls of fields in *Malta*, *Gozo*, *Comino*, *Cominotto*, *Selmun*.

TRIFOLIUM ANGUSTIFOLIUM L. Plant annual, rigid, 1-4 diameter high, stem simple or sometimes branched, with applied hairs. Leaflets longer than the petiole, almost glabrous on the upper surface, lanceolate or linear, entire, acute or acuminate. Stipules narrow, amplexicaul, ciliated, finishing in a filiform apex. Flower-heads spike like, elongated, conical, solitary, pedunculate, usually without stipules at the base, Calyx tubulose-urceolate, with awn-like teeth subequal to the tube, the lower tooth being longer, spreading in the fruit. Throat of calyx hairy. Corolla rosy or purplish, about as long as the teeth of the calyx. (A) Mediterranean region, France, South Russia, Central Europe, Canaries, Azores; naturalised in South Africa. April-June. *Malta*, Wardia, St. Paul's Bay, Pualet, Wied Ghomor, Boschetto, Ghajn il Cbira, Ghajn Mula, Tarxien, Bir-zebbugia, etc. *Gozo*, at Ta Cenc, Imġiar ix-Xini, Xaghra.

Var. *intermedium* (Guss) Fiori-Trifolium *intermedium* Guss. Plant shorter and more spreading, Leaflets broader, and shorter than the petiole. Flower-heads shorter. Teeth of calyx terminating in one or more very long hairs. Corolla white or more usually pale pink. *Malta*, replacing the type here and there, especially on dry red soils, as at Corradino, Attard, Imtaleb, Wied Encita, Verdala Park, Dingli, etc.

TRIFOLIUM SQUARROSUM L. Plant annual, usually with prostrate stems, 5-6 diameter long, glabrous in its lower parts, but scabrous and hairy above. Stipules linear-acuminate. Leaflets hairy, oblong or lanceolate. Flower-heads on peduncles usually shorter than the leaf, and often sessile, rather large, at first globose and then oval, dense, with the base surrounded with sterile caryopses. Calyx hirsute with triangular-lanceolate teeth, about as long as the tube, the anterior tooth being shorter and reflexed in the fruit, the others spreading, the two posterior connate at the base. Corolla white or pale pink, hardly longer than the teeth of the calyx (A) Mediterranean region, Caucasus, Canaries. March-May. The typical form of the species has not yet been detected anywhere in the Maltese Islands.

Var. *dipsaceum* Thuill.-Trifolium *panormitanum* Presl.-t. *squarrosum* minus Rouy. Flower-heads in fruit not more than 22 mm. long. Plant prostrate, 2-5 diameter long. *Malta*, very rare near the Neolithic Temples at Tarxien; first found in April 1923.



TRIFOLIUM MARITIMUM Huds. Plant usually erect, branched from the base, more or less hairy, or sometimes perfectly glabrous, 1-4 diameter high. Flower-heads sometimes naked, but usually enveloped by the upper-most leaves, at first roundish or hemisphaerical, afterwards globose, becoming hard and woody at maturity. Teeth of calyx shorter than the tube triangular-lanceolate, with 3 nerves at the base, the anterior tooth being longer, and becoming spreading and star-like at maturity. Tube glabrous. Corolla white or flesh-coloured, slightly longer than the teeth of the calyx. (A) Western Europe, Mediterranean region, Caucasus, Madeira. April-May. *Malta*, rare, on the glaxis of Floriana and along the road from Fiddien to Imtahleb.-*Trifolium rigidum* Savi.

TRIFOLIUM ECHINATUM M.B. Plant annual, prostrate or ascending, much branched, pubescent or sometimes almost glabrous, 1-5 diameter high. Leaflets obovate or lanceolate, not more than 2 cm long. Flower-heads usually naked, roundish or oval, on long erect peduncles with sessile flowers. Teeth of calyx linear or awn-like, ciliated, about as long as the tube, the anterior one being longer. Throat of calyx hairy. Corolla rosy, about twice as long as the calyx, sometimes whitish or yellowish, with broad wings as long as the keel. (A) Italy, Sicily, Balkan Peninsula, Asia Minor, Mesopotamia. April-May. *Malta*, rare, at Casal Attard, San Antonio and at Floriana; most likely a fresh introduction. First detected in 1914.-*Trifolium supinum* Savi.

TRIFOLIUM PRATENSE L. Plant biennial or perennial, erect or ascending, 1-9 diameter high, usually pubescent but with smooth stems. Stipules white and membranous, ovate, abruptly terminating in a long awn. Lower leaflets obcordate, often with a whitish spot, upper leaflets ovate or elliptical, all hairy on both surfaces or at least on the lower surface. Flower-heads globose or oval solitary or geminate, almost sessile and surrounded by the uppermost leaves. Calyx tubulose obconical, with a hairy tube, and linear-filiform teeth, erect when in fruit, about as long as the tube, the anterior being slightly longer. Throat of calyx hairy, with an annular callosity, accrescent in the fruit. Corolla purplish or pink, rarely white, longer than the teeth of the calyx. (B) or (P) Europe, North Africa, West and Central Asia, Caucasus. April-May. *Malta*, Wied Balluta according to Delicata, Marsa and Marsascala according to Gulia. Must be very rare, possibly accidental.

TRIFOLIUM SPUMOSUM L. Plant annual, glabrous or slightly hairy, with erect or ascending stems 1-4 diameter long. Leaflets broadly obovate-cuneate, rounded or truncated at the apex, acutely toothed. Flower-heads globose, or slightly oval, with peduncles of various lengths. Flowers sessile, with an acuminate bract at the base. Teeth of calyx 3 or 4 times shorter than the tube. Fruiting calyx swollen and bladder-like, ovate or conical, with 24 nerves, reticulated. Corolla rosy white or purplish, about twice as long as the calyx. (A) South Europe, Asia Minor, Caucasus, Algeria. March-May. *Malta*, in exposed situations, at Wied Balluta, according to Delicata. Must be very rare.

TRIFOLIUM RESUPINATUM L. Plant annual, glabrous, stems decumbent, 5-40 cm. long. Stipules triangular acuminate. Upper leaves sessile or

subsessile. Leaflets obovate-cuneate or rhomboidal, acutely toothed, often spotted white. Flower-heads small, axillary, hemisphaerical and then globose with smooth axis, on peduncles equal to or longer than the leaf. Flowers small, subsessile, with free scale-like bracts. Teeth of calyx subequal when in flower. Fruiting calyx with an oblong-conical hood, pubescent, with the two posterior teeth much elongated and spreading. Corolla rosy-purple, about 3 times as long as the calyx, resupinate after flowering. (A) Mediterranean region, Western and Central Europe as far as Crimea, Caucasus, Afghanistan, Canaries, Azores, Madeira. April-June. Common in *Malta*, *Gozo* and *Comino*, on cultivated rocky lands, along walls of fields, country roads etc.

Var. *suaveolens* Auct. It. Plant very robust, with fistulose stems, and peduncles up to 6 cm long. Flowers slightly sweet-scented, 3-4 mm long. Flower-heads 13-15 mm. in diameter-b. *robustum* Rouy. Flowers sometime white, -T. *sauveolens* var *flore-albo* Delicata. In moist and sheltered situations in *Malta*, *Gozo* and *Comino*. The form *gracile* Rouy, with filiform peduncles and slender stems, is also met with in the same localities.

Var. *Clusii* Gr. Et Godr. Plant with slender stems and filiform peduncles. Flower-heads not more than 9 mm in diameter, with shorter hood and teeth. With the species in exposed situations.

TRIFOLIUM TOMENTOSUM. Plant annual, glabrous, with prostrate radiating stems 5-15 cm long. Stipules u.s. Leaves all petiolate, with small obovate or emarginate leaflets. Flower-heads with hairy axis, on peduncles equal to or shorter than the leaf, sometimes sessile; moriform when in fruit. Flowers subsessile, with bracteoles connate 2 or 3 together by their margin. The calyx in flower with the upper teeth shorter than the lower, hidden in the villosity of the tube: the fruiting calyx with a subglobose hood, densely villose, with the 2 upper teeth very short and not spreading. Corolla rosy or rosy white, slightly longer than the calyx. (A) Mediterranean region, Caucasus, Canaries; naturalised in South Africa. April-May. Common in dry open localities, and on uncultivated rocky ground in *Malta*, *Gozo* and *Comino*. The form. *Minus* Gib. Et Belli, with corolla twice as long as the calyx, in dwarf plants with leaflets rounded above, is frequently met with in the dryer situations.

TRIFOLIUM FRAGIFERUM L. Plant perennial, glabrous, or sometimes with villous petioles and peduncles, with many stems, more or less long, prostrate and rooting, 15-40 cm long. Leaves all petiolate, with deep green, obovate-elliptical leaflets, minutely and acutely toothed. Stipules sheathing, scarious, with a long triangular acuminate apex. Flower-heads axillary, solitary, on long peduncles, at first hemisphaerical and afterwards globose or oval, as large as a hazel nut. Flowers subsessile about 6 mm long, furnished with well developed bracteoles at the base, the lower bracteoles being connate so as to form a toothed or plurifid involucre. Fruiting calyx with a globose hood, more or less villose, with the two upper teeth connivent and reflexed. Corolla rosy white, twice as long as the calyx. (P) Europe, North Africa, Abyssinar, West and Central Asia, Canaries, Madeira. May-September. Along ditches, roads and in moist localities. *Malta*, Floriana, Imtahleb, Ghirghenti, Wied Encita,

Imriehel, Wied Musta, Wied Casal Lia. Gozo, Xlendi, Via marsalforno, Kbaijar, Wied Ramla, Wied il Lunziata, Zenka-Migiarro.

Var. *pulchellum* Lange Plant small, woody, prostrate, with very short dense stems, shaped like a cushion. Leaflets small, elliptical, green or somewhat glaucous, with flower-heads not exceeding 1 cm in diameter. In dry rocky situations. *Malta*, at Ghirghenti, Dingli, Migiarro.

Var. *halicola* Gib et belli. Plant small prostrate, with thick woody stems, rarely more than 10 cm long, fleshy and tender at the extremity. Leaflets small, elliptical, intensely glaucous and covered with a saline efflorescence. Flower-heads less than 1 cm in diameter. Frequent in dry, or even rather moist soils close to the sea. *Malta*, at Saline, St Paul's Bay, Mghatab, Bahar ic-Ciaghak, Melleha.

TRIFOLIUM SUFFOCATUM L. Plant annual, glabrous or almost glabrous, with short stems, prostrate all round, partly underground. Stipules finished in a triangular-acuminate apex. Leaves all with a long petiole: leaflets small, obcordate cuneate, toothed above. Flower-heads sessile, ovate or globose, with sessile or subsessile flowers, which do not become reflexed in the fruit, axillary, present even at the base of the stems and partly underground. Calyx tubular, with triangular acuminate teeth about as long as the tube becoming reflexed when in fruit. Corolla white or very pale pink, much shorter than the teeth of the calyx. Legume sessile, included. (A) Mediterranean region. Western Europe, Hungary, Caspian region, Canaries and Madeira. March-May. Very common in dry localities especially along roads, and footpaths, in *Malta* and *Gozo*.

TRIFOLIUM NIGRESCENES Viv. Plant annual, glabrous, with numerous erect or ascending stems, often prostrate all round forming a thick carpet, 5-35 cm long. Stipules scarious, terminating in an acuminate appendix. Leaflets obovate or obcordate, often spotted black, with toothed margin often spinescent. Flower-heads axillary, on peduncles longer than the leaf, somewhat loose, at first flobose, umbel-shaped when in fruit. Flowers with pedicels, central pedicels longer or shorter, all becoming reflexed when in fruit. Fruiting calyx cylindrical-campanulate, teeth subequal to the tube. Corolla twice as long as the calyx, white or greenish white, or later turning light pink, or flesh-coloured. Legume included, or sometimes protruding, torulose. (A) Mediterranean region, Hungary, Caucasus. March-May. Very common on uncultivated ground, along walls of fields and country roads, and also in fields of sulla, in *Malta*, *Gozo* and *Comino*. – *Trifolium hybridum* Savinon L.

Var. *polyanthemum* Ten. Plant more robust, usually erect, with fistulose stems. Teeth of calyx longer than the tube. Central flowers with pedicels longer than those of the outer. Corolla white. With the species in fields and moist localities.

TRIFOLIUM REPENS L. Plant perennial, with many creeping stems, rooting and often stoloniferous 1-4 diameter long, glabrous. Stipules long and

sheathing, terminating in long awn-like appendix. Leaves all furnished with a long petiole. Leaflets roundish, oval or obcordate, acutely toothed, often spotted or dotted white. Flower-heads globose, and afterwards umbel-shaped after flowering, about 2 cm. in diameter, axillary or rarely radical, on very long peduncles. Lower teeth of calyx shorter than the tube, the upper teeth being about as long, lanceolate-acuminate. Corolla usually clear rose, but may be white or yellowish white, slightly less than twice the length of the calyx. Flowers with pedicels reflexed after flowering. Legume with 2-4 globose seeds. (P) Europe, North Africa, Western and Central Asia; naturalised elsewhere. March-May. *Malta*, Wied Kirda, Marsa. According to Delicata and Gulia.

**TRIFOLIUM CAMPESTRE** Schreb. Plant annual, somewhat hairy, erect or ascending, 5-40 cm. high. Stipules semioval, dilated at the base, acuminate. Leaves with short petiole; leaflets mostly obovate cuneate, the middle one distinctly petiolate, so that the leaf is rather tritolate. Flowers small, yellow or pale yellow, very rarely rosy or purplish, on pedicels shorter than the tube of the calyx, grouped in dense heads of 20 or more flowers. Flower-heads globose or more often oval, usually about 1 cm. in diameter, on peduncles about as long as the leaf. Lower 3 teeth of calyx slightly shorter than the tube, the lower 2 more triangular and shorter than the tube. Standard of corolla rounded-obovate, toothed on the sides. Legume about as long as the pedicel. (A) Europe, North Africa, Western Asia as far as the Caucasus, Abyssinia; naturalised elsewhere. March-May. Common in fields, country roads and on uncultivated or rocky ground, in *Malta*, *Gozo* and *Comino*.-*Trifolium agrarium* (L) Pollich.-t. *procumbens* (L) Sm. The dwarf. Form. *Nanum* Ser. in D.C. is frequent in dry and exposed localities. The form. *Schreberi* Jord. With smaller heads, and peduncles about twice as long as the leaf, is met with along with the typical form, but is far less frequent. All local plants have pale yellow flowers.

The vulgar name of *Trifolium* generally, is Clover or Trefoil in English, Trifoglio or Moscino in Italian, Xnien in Maltese.

#### HYMENOCARPUS Savi.

Flowers in axillary umbels. Calyx campanulate, with 5 subequal teeth. Petals with short claw: keel beaked. Stamens didelphous. Ovary sessile with 2 ovules. Legume curved, reniform-orbicular, compressed, leaf-like, broadly winged, indehiscent, with 2 reniform seeds. Includes only one species.

**HYMENOCARPUS CIRCINATUS** Savi. Plant annual, herbaceous, softly hirsute, with diffuse or decumbent stems, 1-5 diameter long. Lower leaves petiolate, simple, oblong; the others are sessile, with 2-4 pairs of oval-lanceolate leaflets and with a terminal much larger ovate-oblong leaflet, entire. Stipules wanting. Flowers axillary, in 2-4 flowered umbel on a peduncle equal to or longer than the leaf, usually with a leaflet forming an involucre. Corolla yellow, hardly longer than the calyx. Legumes with applied pubescence, having usually bifid spines along the outer margin. (A) Mediterranean region. March-April. *Gozo*, along the road from Victoria to marsalforno, Ta harrax, Id-

Dabrani, Kbaijar, Ras il Kala and Ramla-Circinus cirinatus O. Kuntze-  
Medicago circinata L-Circinus vulverarioides Medic-Cornicina circinata L.

#### ANTHYLLIS (Riv.) L.

Flowers axillary, in heads, clusters or solitary. Calyx tubulose, 5-toothed, sometimes accrescent or bladder-like when in fruit. Petals with a long claw: keel beaked. Stamens monodelphous, rarely didelphous. Ovary stipitate with few ovules. Legumes ovate, enclosed in the calyx, usually one-seeded, indehiscent, or with late dehiscence in two valves; with reniform seeds. Stipules wanting. Species about 20, natives of Europe and the Mediterranean region.

ANTHYLLIS TETRAPHYLLA L. Plant annual, herbaceous, softly hirsute, with few prostrate stems 1-5 diameter long. Leaves subsessile or with very short petiole, having a large terminal leaflet, obovate and mucronate and 2 or 3 very small lateral leaflets. Flower-heads axillary, with 3-6 flowers, subsessile. Calyx with a silky pubescence, at first tubulose and then rapidly becoming swollen and bladder-like with equal teeth, connivent when in fruit. Corolla slightly longer than the calyx, yellowish white with the keel tipped red. Stamens didelphous. Legume villose (A) Mediterranean region. March-May. *Malta*, at Wied Encita, St Paul's bay, Marfa, Wied Gherzuma, Wied Ghomor, Wied Mokbel etc. *Gozo*, Pergla, Wied ir-Rihan, Wied Bingemma, Xaghra, Ta Cenc. *Comino*, on the hills around Kala Sta. Maria. Nowhere common.-  
*Physanthyllis tetraphylla* Boiss. E. Four-leaved Kidney-Vetch.

ANTHYLLIS VULVERAIEA L. Plant herbaceous, usually perennial, more or less hirsute or with silky pubescence, with annual stems procumbent or ascending. Lower and radical leaves petiolate, simple, oblong-lanceolate: upper leaves with 3-6 pairs of oblong-linear leaflets, and with a large terminal ovate or oblong leaflet. Flower-heads many-flowered, terminal, solitary or geminate, with two involucreal digitate leaves. Calyx villose, obliquely bilabiate; teeth much shorter than the tube. Calyx more or less membranous, white, or pale yellow or pale pink. Corolla usually yellowish-orange, white or reddish at the tip; claw of standard much longer than the limb. Legume glabrous, semiovate, about as long as its pedicel. (A) or (B) or (P) Europe, Mediterranean region, Caucasian region, Abyssinia-Vulneraria heterophylla Moench. E. Kidney Vetch, Lady's Fingers. I. Vulneraria. M. Silla tal Blat, Silla salvagga.

Var. *rubra* L.-*Anthyllis Dilleni* Schutz-*Anthyllis Vulneraria* var. *rubriflora* Ser. in D.C. Stems 2-3 diameter long, naked above. Corolla red or violet. Calyx whitish at the base, purplish-brown above, oval or oblong. Cauline leaves with 3-5 pairs of leaflets. On rocky ground, uncultivated land, in dry and arid localities. Very common in *Malta*, *Gozo* and *Comino*, forming extensive reddish carpets as at Boschetto and Comino.

ANTHYLLIS HERMANNIAE L. A woody erect or ascending shrub, very much branched and tortuous, 1-5 diameter high. Tender twigs and calyx clad with applied hairs; old twigs often terminating in a spine or spinescent. Leaves

with a short petiole and with 1-3 linear-oblong leaflets, usually folded up along the midrib; the floral leaves simple and shorter than the flowers; all more or less hairy. Flowers in clusters of 2-5; 6-9 mm. long, on short pedicels. Teeth of calyx subequal, triangular-acute, about half the length of the tube. Corolla yellow, keel obtuse and almost straight. Legumes oblong and glabrous. (P) Italy, Sicily, Sardegna, Corsica, Balearic Islands, the Balkan Peninsula and Asia Minor. March-June. Frequent in *Malta*, *Gozo*, *Comino* and *Cominotto* on rocky and uncultivated ground in dry localities-Cytisus graecus L. M. Hatba is-Seuda.

#### LOTUS (Tourn.) L.

Herbs annual or perennial, with pinnate leaves of 5 leaflets, of which 3 are inserted at the apex of the petiole, and 2 at the base, in the place of and simulating the stipules. Stipules wanting or reduced to a tubercle. Flowers in umbels, axillary and peduncled, rarely solitary or geminate. Calyx conical-campanulate, sometimes bilabiate. Corolla with beaked keel. Stamens diadelphous. Ovary sessile with many ovules. Legumes linear or oblong, cylindrical or rarely compressed, straight or curved, often with false septa of cellulose tissue between the seeds, dehiscent in two valves which become coiled spirally. Seeds subglobose or lenticular. Includes about 80 species, natives of Europe, temperate Asia, North and South Africa, and Australia.

LOTUS CORNICULATUS L. Plant perennial, glabrous, or with few long spreading hairs, and with numerous prostrate or ascending stems spread all round, 1-4 cm. long. Leaves with a short petiole. Peduncles usually much longer than the leaf. Calyx with triangular-acuminate or lanceolate linear teeth, about as long as the tube. Corolla twice or thrice as long as the calyx, yellow, often with reddish wings, the standard becoming deep green when dried. Legume linear, straight, cylindrical, 15-30 mm. long. (P) Europe, North and Central Asia, North Africa as far as Abyssinia, naturalised elsewhere.

Var. *decumbens* Poir. Lower leaves with obliquely ovate or oblong-obovate leaflets; upper leaves with lanceolate leaflets. Umbels of 1-6 flowers, on peduncles only 3-5 times as long as the leaf, and sometimes shorter. Teeth of calyx linear, longer than the tube. Plant ciliated or somewhat hairy, with angular stems. March-June. In moist localities and along streamlets. *Malta*, rather frequent at Saline, Pualet, St Paul's bay, Imtahleb, Fiddien, Wied Balluta. The form: glaber *Gulia*, with the floral leaf close to the umbel is found at Fiddien. E. Bird's foot Trefoil. I. *Ginestrina*, *Trifoglio giallo*, *Mulaghera*. M. *Ghantcux*.

LOTUS CRETICUS L. Plant perennial, with a woody root. Stems prostrate or ascending somewhat woody and naked at the base, 1-3 diameter long. Foliage of silky and silvery appearance; petioles very short or wanting. Leaflets lanceolate or oblong-acute, sometimes obtuse. Calyx bilabiate, with oblong lanceolate teeth. Corolla one and one half to two times as long as the calyx, yellow. Legume linear, straight u.s. (P) Mediterranean region and Abyssinia. February-June. On rocks close to the sea, common in *Malta*, *Gozo*, *Comino*, and *Cominotto*, also on *Selmun* and *Hagret il General*.

Var *cytisoides* L. Foliage green or greyish green; petioles longer, sometimes equal to the stipular leaves; leaflets obovate-cuneate. Pubescence often rather long, almost equalling that of the species. With the species at Wied Baby, Wied iz-Zurriek, St Paul's bay, San Martin, Ghain Tuffieha, Majesa etc. in Malta, and at Xlendi and Imgiar ix-Xini in Gozo. The form: *coronillaefolius* Guss. With more slender stems and shorter pubescence closely applied, is met with in more exposed localities.-*Lotus prostratus* Desf.-*L. Allionii* Desv.

**LOTUSONITHOFODIOIDES** L. Plant annual, pubescent with closely applied hairs, with diffuse stems 1-3 diameter long. Leaflets large, rhomboid-oval, with stipular leaflets of same shape as long as the petiole. Peduncles axillary, 3-5 flowered, bracteate, often twice as long as the leaf. Calyx bilabiate, with lanceolate acute teeth, of which the middle one of the lower lip is twice as long as the laterals. Corolla yellow, one and one-half times as long as the calyx. Legumes linear, very compressed, curved, 3-4 cm long all hanging on one side. (A) Mediterranean region and the Caucasus. February-May. In fields and on rocky uncultivated ground. Very common in *Malta*, *Gozo* and *Comino*.

**LOTUS PUSILLUS** Medic. Plant annual, pubescent-tomentose, with ascending or erect stems 5-20 cm. long. Leaflets small, obovate-oblong. Stipular leaflets obliquely oval, longer than the petiole. Peduncles axillary, bracteate, 2 or 3 times as long as the leaf, bearing one flower rarely 2 or 3. Calyx and corolla u.s. Legumes linear, slightly compressed curved at the tip, very narrow, 13-25 mm long. (A) North Africa, South Italy, Sicily, Greece, Asia Minor, Persia. March-April. In arid rocky localities and sandy beaches. *Malta*, Marfa and Melleha, *Gozo*, at Ramla, Kbaijar, San Blas. *Comino*, at Kala Sta maria and on the rocky hills around it and along the valley.

**LOTUS EDULIS** L. Plant annual, pubescent-villose, with diffuse or ascending stems 1-4 diameter long. Terminal leaflet obovate-cuneate, the laterals with oblique base; stipular leaflets obliquely subcordate, slightly longer than the petiole. Peduncles axillary, 2 or 3 times as long as the leaf, bearing one, rarely two to four flowers. Teeth of calyx linear-lanceolate, subequal, twice as long as the tube. Corolla large, yellow, slightly longer than the calyx. Legume thick, curved, fleshy, becoming coriaceous at maturity, incompletely bilocular, deeply grooved along the dorsal suture, 25-35 mm. long, with an acute beak. (A) Mediterranean region. March-May. In fields and uncultivated ground, common in *Malta*, *Gozo*, *Comino* and *Filfol*. E. Edible Bird's-foot Trefoil. M. Krempuc. The tender pods are greedily sought after and eaten by children.

**LOTUS CONJUGATUS** L. Plant annual, villose-tomentose, with diffuse or ascending stems 1-3 diameter long. Leaves with a short petiole. Leaflets obovate-rhomboid, acuminate; stipular leaflets ovate-acuminate, with a broad base adherent to the petiole. Peduncles bracteate, axillary, equal to the leaf or slightly longer, bearing 1-2 flowers. Calyx hirsute, with linear-lanceolate teeth, about 2 or 3 times as long as the tube. Corolla small, about as long as the calyx, yellow. Letume glabrous, narrow, 15-30 mm. long, with four narrowly winged angles. (A) Mediterranean region. March-May. In fields and

among corps; *Malta*, at Corradino, Wied Kirda and Marsa according to Delicata and Gulia- *M. Figgeila safra*.-*Tetragonolobus conjugatus* Link.-*Lotus conjugatus* var. *Gussonei* Huet.-*L. Requienii* Lojacono non Mauri.

**LOTUS TETRAGONOLOBUS L.** Plant annual, hirsute, with spreading ascending stems 1-4 diameter long. Leaflets obovate-rhomboid, apiculate. Stipular leaflets ovate-cordiform, adherent u.s. Peduncles as long as or longer than the leaves, one-flowered, rarely with two flowers. Calyx villose, with teeth longer than the tube. Corolla large, velvety purplish red, rarely yellow, about twice as long as the calyx. Legume large, straight, thick, fleshy, becoming coriaceous when dry, with a long beak, and with four crisp-edged winged angles, usually glabrous. (A) South Europe, North Africa, Cyprus and the Caucasus. February-May. Common in fields and uncultivated wastes, in *Malta*, *Gozo* and *Comino*. E. Winged Pea. *M. Figgiela hamra*-*Tetragonolobus purpureus* Moench. The form with the corolla splashed or shaded yellow, or almost entirely yellow (form. *Bivoneus* Guss.) is met with at Wied Encita, Boschetto and Ghain il Cbira, but is far less common.

**LOTUS BIFLORUS Desr. in Lam.** Plant annual, pubescent-villose, with stems u.s. Leaflets u.s. the laterals with oblique base; stipular leaflets ovate-rounded, finely dotted, with base adherent u.s. Peduncles axillary, bracteate, 2-3 times as long as the leaf, with one or two flowers. Calyx tubulose, villose, marked with ochre-coloured lines, with triangular-lanceolate teeth, about half the length of the tube. Corolla golden yellow about twice as long as the calyx. Legume hairy, thick, fleshy, with four narrow crisp-edged winged angles. (A) South Italy, Sicily, Tunisia and Algeria. March-May. In fields among crops. *Malta*, Maghlaq, Corradino; *Gozo*, Wied il Lunziata. According to Delicata and Gulia: must be rare.

#### ASTRAGALUS (Tourn.) L.

Herbs with imparipinnate leaves, rarely paripinnate and in that case the rachis is prolonged as a spine. Stipules free, or rarely adherent to the petiole, or connate together forming one stipule opposed to the leaf. Flowers axillary, in racemes, or rarely in heads or clusters. Calyx tubulose-campanulate, more or less bilabiate, with 5 teeth, of which the upper two are shorter. Corolla with obtuse keel, sometimes mucronate. Legume with 2 valves, more or less bilocular owing to a false longitudinal septum, rarely quite unilocular, of various shapes. Seeds more or less numerous, reniform or cuboid. This large genus includes about 1,300 species, mostly natives of the Oriental region as far as Central Asia, but broadly distributed also in most temperate regions of both hemispheres.

**ASTRAGALUS SESAMEUS L.** Plant annual, hirsute, of a greyish or ashy colour, with villose prostrate stems 1 to 3 diameter long. Leaves imparipinnate, with 8-10 pairs of oblong or oval leaflets, often emarginate. Stipules free, acuminate. Flowers in axillary head-like racemes, sessile or subsessile, with 4-10 flowers. Calyx campanulate, with teeth about as long as the tube, with white and black hairs. Corolla pale blue, sometimes whitish, about as long as the calyx. Legumes hirsute with applied hairs, oblong,



somewhat trigonous, grooved along the dorsal suture, with a long acuminate beak, 10-15 mm long with 14-16 seeds. (A) South Europe and North Africa. March-April. Frequent in exposed and arid situations, along country roads and on uncultivated and rocky ground. *Malta*, Boschetto, Ta Baldu, Fawwara, Bahria, Floriana, Corradino, Cottonera, Ricasoli, Zabbar, Pembroke Camp etc. *Gozo*, Xaghra, Nadur, Xeuchia, Ta Cenc, Ta Harrax, Gran Castello etc. *Cominotto*.

**ASTRAGALUS BAETICUS L.** Plant annual, very vigorous, slightly hirsute, with thick hollow stems, erect or ascending 1-6 diameter long. Leaves imparipinnate, with 9-15 pairs of oblong or linear emarginate leaflets. Stipules free, acuminate. Racemes axillary, dense, with 5-15 flowers, on a long peduncle shorter than the leaf. Calyx u.s. Corolla pale yellow, thrice as long as the calyx. Legumes straight, oblong-trigonous, almost glabrous, with thickened sutures, deeply grooved on the dorsal suture, mucronate at the tip, 2-3½cm long, with 6-12 seeds. Seeds oblong or cuboid. (A) Mediterranean region (except France and Dalmatia), as far as Persia, Madeira. March-May. Frequent in valleys, and on uncultivated ground, especially in shaded localities, on all sorts of soil. *Malta*, Gneina, ghain tuffieha, Bahria, Majesa, Ta Baldu, Melleha, Marfa, Wied Babu, Boschetto, Wied iz-Zurriek, Zabbar, Floriana etc. *Gozo*, at Ramla, Garbo, Kercem, Wied il Lunziata etc. *Comino*, in the valley at kala Sta Maria. E. Milk-Vetch. M. Café Messican. The seeds are used roasted and ground as a substitute for coffee, and for this reason the species is frequently cultivated among sulla and vetches.

**ASTRAGALUS HAMOSUS L.** Plant annual, pubescent with applied hairs. Stems erect, or ascending, or diffuse 1-6 diameter long. Leaves imparipinnate with 4-12 pairs of ovate or oblong leaflets, emarginate or obcordate. Lower stipules opposed to the leaf, acuminate and bifid. Racemes dense and head-like, on peduncles not longer than the leaf, bearing 3-12 flowers. Calyx u.s. Corolla 3 times as long as the calyx, pale yellow. Legumes at first pendulous, and then recurved upwards like a fish-hook, smooth, linear-cylindrical almost glabrous, mucronate, 2-3 cm long, with 20-25 seeds. (A) Mediterranean region as far as the Caucasus and Northern India, Canaries. February-May. Very common in fields among crops, in gardens, along roads, and on uncultivated or waste ground in *Malta*, *Gozo*, *Comino* and *Cominotto*. The form. *Buceras* Willd., of more robust habit, with legume up to 6 cm long, is often met with in fields of sulla and in gardens.

#### PSORALEA L.

Herbs with trifoliate leaves. Flowers in axillary heads or spikes. Calyx campanulate, almost bilabiate, the anterior tooth being longer. Corolla with obtuse keel made of 2 petal almost free. Stamens often partly didelphous. Legume one-locular, with only one reniform seed, indehiscent. Included about 100 species, natives mostly of temperate regions in both hemispheres, chiefly of South Africa and North America.

**PSORALEA BITUMINOSA L.** A perennial herb, more less hairy, with minute glands emitting a strong resinous or bituminous odour, often stoloniferous,

with erect stems 2-6 diameter high. Leaves furnished with a long petiole, with three oblong-lanceolate leaflets. Stipules long and acuminate. Flowers numerous in axillary, solitary, subglobose heads, surrounded by bracts with 2 acuminate teeth, and inserted on peduncles longer than the leaves. Calyx densely hirsute, with long awn-like teeth. Corolla purplish-blue or pale violet, slightly longer than the teeth of the calyx, rarely pure white (form. *Albiflora*). Legumes oval, compressed, hirsute, with a long beak protruding beyond the calyx. (P) Mediterranean region, South Russia, Arabia and the Canaries. February-May. Common in valleys, on rocky and waste lands, on hillsides, in arid as well as in moist localities, in *Malta*, *Gozo* and *Comino*. E. Bitumen Trefoil or Scufy Pea. M. *Silla salvagga*.

The form. *Palaestina* Gouan., with ovate or roundish lower leaflets, and lanceolate or linear upper leaflets, is frequent with the type as *Wied Encita*, *Boschetto* etc. in *Malta*, as well as in *Gozo* and *Comino*.

### ROBINIA L.

Trees or shrubs with imparipinnate leaves, and flowers in axillary pendulous racemes. Calyx campanulate, almost bilabiate, with short teeth, almost triangular. Corolla with obtuse curved keel, and standard without appendices. Legume linear, compressed, with the dorsal suture very narrowly winged, unilocular, with 2 membranous valves, and with 4-7 oblong-reniform seeds. Includes 6 species, natives of North America and Mexico.

ROBINIA PSEUDO-ACACIA L. A tree 4-10 m high, with a very hard yellowish brown wood and cracked greyish bark. Leaves glabrous, furnished with petiole and a thick pulvinus, and with 4-9 pairs of petiolate leaflets, oval or oblong, entire, mucronate or emarginate at the apex. Stipules usually thorny; a minute setaceous stipule exists at the base of the petiole of each leaflet. Racemes many-flowered on long peduncles; flowers sweet-scented, with rather long pedicels, with rather large bracts rapidly deciduous. Calyx pubescent. Corolla large, white standard yellowish at the base. Legumes glabrous, 5-10 cm long. (S) Native of North America. Cultivated and naturalised in gardens, as at San Antonio and *Boschetto*. E. False-Acacia, Locust tree, I. Acacia, Robinia, M. Robinia.

### SCORPIURUS L.

Herbs with simple leaves. Flowers solitary or in umbel on an axillary peduncle. Calyx campanulate, almost bilabiate, with the upper two teeth shorter than the others. Corolla with a beaked keel. Legume cylindrical, very long, convolute, grooved longitudinally, with the external ridges armed with spines or tubercles. Seeds oval or curved. Includes six species natives of the Mediterranean region, Abyssinia, Canaries and Madeira.

SCORPIURUS MURICATUS L. An annual herb, pubescent or subvillose, often almost glabrous when growing on rich moist soils, with long diffuse weak stems 5-35 cm long. Leaves oblong-spathulate almost lanceolate, acute, entire, attenuated at the base. Stipules long and acuminate. Peduncles

axillary, angular, equal to or longer than the leaf, bearing 1-4 flowers, with a very small bracteole at the apex. Flower-pedicels short and reflexed when in fruit. Teeth of calyx lanceolate-acuminate, longer than the tube. Corolla twice as long as the calyx, yellow, splashed red at the base. Legume contorted or convolute, having conical tubercles or hooked spines on the outer ridges. Seeds curved, pointed at both extremities. (A) Mediterranean region, South Russia, Abyssinia, Canaries, Madeira. The typical form having legumes with conical tubercles instead of spines, has not been found in the Maltese Islands

Var. *subvillosus* L. Legumes usually closely convolute, with long slender hooked spines on the outer ridges; glabrous and usually straw-coloured, or (in the form. *Eriocarpus* Ten.) hairy or hirsute and usually reddish violet. March-May. Common everywhere, in fields, uncultivated ground, valleys, rocky wastes etc. in *Malta*, *Gozo*, *Comino* and *Cominotto*, E. Caterpillar-plant. I. Scorpiuro. M. Widna. Commonly cultivated as forage.

**SCORPIURUS VERMICULATUS L.** An annual herb, slightly villose, with stems u.s. Leaves and stipules u.s. Teeth or calyx equal to the tube. Corolla u.s. Legumes closely convolute, glabrous, with internal ridges hardly marked, and with stipitate and capitate tubercles on the outer ridges. Seeds elliptical. (A) Mediterranean region and South Russia, March-April *Malta*, Wied Balluta and Cottonera, according to Delicata and Gulia.

#### ORNITHOPUS L.

Plants annual, slender, with imparipinnate leaves, and small white or pink flowers in heads or umbels on an axillary peduncle. Calyx tubulose-campanulate, with subequal teeth. Corolla with obtuse keel. Stamens diadelphous. Legume linear, more or less curved, mucronate and hooked at the apex; with transverse circular crests marking off the joints; with one oblong seed in each joint. Includes 8 species, natives of the Mediterranean region, Central Europe, Canaries and South America.

**ORNITHOPUS COMPRESSUS L.** Plant villose or pubescent, with slender stems decumbent or ascending 1 to 5 diameter long. Stipules minute or wanting. Lower leaves petiolate, the upper sessile, with 5-15 pairs of small oblong-elliptical, mucronate leaflets. Flowers small 2-5 in an umbel enveloped in a long pinnate bract, on a peduncle about as long as the leaf. Teeth of calyx linear, shorter than the tube. Corolla yellow. Legumes 3-4 cm long, pubescent compressed, curved, terminating in a long hook. (A) Mediterranean region, West Europe, Madeira, Canaries. February-May. *Malta*, rare, at Ghain Dwieli Corradino, Addolorata Cemetery.

#### CORONILLA (Tourn.) L.

Herbs with imparipinnate leaves, rarely ternate or simple. Flowers in umbels on axillary peduncles. Calyx shallow, campanulate, almost bilabiate, with the upper 2 teeth smaller and connivent. Corolla with a curved beaked keel. Legume glabrous, straight or curved, linear, cylindrical or prismatic, more or

less lomentaceous, but dehiscent into valves or transverse segments of valves. Seeds oblong.

**CORONILLA SCORPIOIDES (L) Koch.** An annual, glabrous plant, very glaucous, with erect or ascending stems 1-3 diameter long. Leaves fleshy; lower leaves usually simple cuneate-oblong, or sometimes trifoliolate with almost equal leaflets; the other leaves trifoliolate, with the 2 lateral leaflets sessile, orbicular and smaller than the terminal, which is larger, oval and petiolate. Stipules small, connate into one, opposed to the leaf, and acutely bifid. Flower-stalk slightly longer than the leaf, with 1-4 small flowers, having small bracteoles. Flowers on short, thick pedicels. Calyx with small triangular acute teeth. Corolla yellow, petals with claw hardly longer than the calyx. Pods tetragonous, curved, 3-5 cm long, terminating in a short beak. (A) Mediterranean region, South Russia, and the Caucasus. March-May. Frequent in gardens and in fields among growing crops, as well as in valleys, wastes, and uncultivated land in *Malta*, *Gozo*, *Comino* and *Cominotto*. I. Iie di Corvo, Cantarella. M. Xeht l'Imhabba,, Morra.

**CORONILLA VALENTINA L.** An evergreen shrubby glabrous, glaucous perennial, much branched, 2-7 diameter high. Branches densely covered with leaves. Leaves petiolate, with 4-6 pairs of fleshy leaflets, obovate-cuneate, emarginate or obcordate at the apex, retuse or mucronate, not more than 4 mm broad. Stipules large deciduous. Flower-stalks axillary and terminal, longer than the leaves, with 4-12 flowers, strong-scented, without bracteoles, and on pedicels subequal to the calyx. Corolla golden yellow. Pods pendulous, straight, 15-25 mm long, with 4-7 seeds. (A) South Europe and North Africa. February-April. In valleys and on rocky ground. Rather rare. *Malta*, Wied Babu, Wardia, Majesa, Gneina, Wied Kirda, Wied iz-Zurriek. *Gozo*, Marsalforno-*Coronilla stipularis* Lam. E. Crown Vetch.

Var *glauc*a L. Plant glaucous green, less glaucous than the typical form, with small lanceolate-acuminate deciduous stipules. Leaves with 2-3 pairs of leaflets, rarely obcordate, usually truncated-emarginate, and retuse. Legumes with 1-3 seeds. With the species at Wied Babu, Wardia and Marsalforno, but very rare.

**CORONILLA EMERUS L.** An erect perennial evergreen shrub, almost glabrous, with angular branches, suckering freely from and around the base, 1-3 m high. Leaves petiolate, with 2-4 pairs of obovate-cuneate leaflets, often emarginate, and glaucous on the lower surface. Stipules small, free, triangular. Bracteoles small and hairy. Flower-stalk about as long as the leaves, with 2-3 flowers. Pedicels shorter than the calyx. Flowers large, golden yellow, scentless. Calyx with short teeth, gibbose at the base. Claw of petals about 3 times as long as the calyx. Legumes pendulous or spreading, subcompressed, striated, 4-6 cm long, dividing into 7-10 joints with as many seeds. (A) Central and South Europe, tunisia, Asia Minor. February-April. *Malta*, very rare, at Wied Babu, and at Wardia; frequently cultivated in gardens. *Gozo*, also very rare, at Ta Harrax. The plants grown in gardens both in Malta and Gozo, have originated from the native plants. E. Scorpion Senna.

The above three species of *Coronilla* are considered as irritant and poisonous.

### HIPPOCREPIS L.

Herbs with imparipinnate leaves. Flowers in umbels on axillary peduncles, or solitary or rarely geminate. Legumes curved, with joints hollowed out along the dorsal suture, like a horse-shoe, dividing into as many joints when dry, each joint containing one curved seed. The rest as in *Coronilla*. Includes about 10 species natives of the Mediterranean region and the Canaries; one being found also in Central and Western Europe.

**HIPPOCREPIS MULTISILIQUOSA L.** Plant annual, glabrous, or very sparsely haired, with erect or ascending stems 1-3 diameter long. Leaves petiolate with 2-7 pairs of abrupt or emarginate leaflets. Stipules lanceolate-acuminate, with one or two globose glands at the base. Peduncles axillary, solitary, equal to or slightly longer than the leaves, with 2-6 flowers, with minute bracteoles, and pedicels shorter than the calyx. Teeth of calyx lanceolate-acute. Corolla golden yellow, small. Legumes very arched, with dorsal excavations forming or almost forming a complete circle, dividing when dry into 3-7 joints. Legumes glabrous, or papillose and glandular along the dorsal suture. (A) Mediterranean region, South Russia, Madeira, Canaries. March-May. Along walls of fields, among growing crops, in valleys and on uncultivated land. Common in *Malta*, *Gozo*, *Comino* and *Cominotto*. E Horse-shoe Vetch. I Budellina, Millegrani. M. Cintilli.

Var. *ciliata* Willd. Legumes hirsute and scabrous along the dorsal suture, with dorsal excavations directed usually towards the concave side of the pod, being always directed towards the convex or dorsal side of the pod in the typical form. With the species, but rather rare. *Malta*, Boschetto, St Paul's Bay, Melleha, Wied il Ghasel; *Gozo*, at Wied Bingemma, Wied ir-Rihan, rocky lands near Ramla. *Comino* and *Cominotto*.

**HIPPOCREPIS UNISILIQUOSA L.** Plant annual, glabrous, with short prostrate-stems 5-25 cm. long. Leaves u.s., Peduncles u.s., bearing only one flower, rarely two, almost sessile. Legumes straight or only slightly curved, with 4-6 joints, with the sinuses directed towards the dorsal suture, papillose and scabrous along the same suture. (A) Mediterranean region, Transylvania, South Russia, Caucasus. March-May. Common along walls of fields, country roads, and on uncultivated land in *Malta*, *Gozo*, *Comino*, and *Cominotto*. The form. *Leiocarpa* Rouy-monocarpa M.B., with perfectly glabrous legumes, is found with the type, especially in exposed and arid situations. The form: *biflora* Raf., with peduncles occasionally two-flowered, is much rarer; Wied Encita, Boschetto.

### HEDYSARUM (Tourn.) L.

Herbs with imparipinnate leaves. Flowers in axillary capitate or spike-like racemes. Calyx shortly campanulate, with almost equal teeth. Corolla with

keel obliquely abrupt at the apex. Legume compressed, lomentose, jointed, breaking into indehiscent rounded joints, spinous or smooth, each containing one reniform seed. Species about 60, natives of Europe, temperate Asia, North Africa and North America.

**HEDYSARUM SPINOSISSIMUM L.** Plant annual, more or less pubescent with applied hairs, and prostrate stems 1-5 diameter long. Leaves with short petioles, with 4-5 pairs of small, abrupt or emarginate leaflets, obovate in the lower leaves, oblong or linear in the upper. Stipules free, scarious, ovate-acuminate. Flowers in head-like racemes of 4-6, on peduncles longer than the leaf, with very short pedicels and long bracts. Teeth of calyx lanceolate, about twice as long as the tube. Corolla deep rose, about 12 mm long. Legumes pubescent, with 1-4 round joints, armed with long hooked spines. (A) Mediterranean region. The typical form is found only in Spain.

Var. *pallens* Rouy.-*Hedysarum capitatum* guss.-H.*Sibthorpii* Nym.-H. *capitatum* var. *pallens* Moris. Flowers pale-rose, 8-10 mm long, in heads of 3-8 flowers. March-May. *Malta*, Melleha, Ahrax, Ghain Tuffieha; *Comino*, very abundant in the central part of the Island. M. Silla salvagga.

**HEDYSARUM CAPITATUM Desf.** Non Guss. Plant annual, u.s. Flowers rosy-purple; corolla 15-20 mm long. Peduncles hardly longer than the leaf, and often shorter, with 5-10 flowers. Legumes more pubescent and with shorter spines. The rest u.s. (A) Mediterranean region. March-May. *Malta*, rather rare, at Ricasoli, Ghain tuffieha, Marfa, Marsascirocco, Delimara, Melleha, Gneina; *Gozo*, rare, at Xlendi. M. Silla salvagga.-*Hedysarum spinosissimum* Ten.-H. *spinosissimum* var. *capitatum* Fiori.-H. *corsicum* Balb. Often described as a variety of the preceding species.

**HEDYSARUM CORONARIUM L.** Plant perennial, pubescent, with erect or prostrate-ascending stems 1-10 diameter long. Leaves large, petiolate, with 3-5 pairs of oval or elliptical leaves, hairy on the undersurface and along the margin, glabrous and smooth on the upper surface, with triangular-acuminate stipules. Peduncles shorter than the leaf, bearing a long spike-like raceme, with many flowers, usually extending beyond the leaf. Corolla large, bright purplish red, with a standard slightly longer than the keel and wings. Legumes with 2-4 roundish joints, thickened at the margin, covered with tubercles and short soft spines. (P) Western Mediterranean region. March-May. *Malta*, at Gneina, Imtahleb, Bahria, Ghain tuffieha, Wardia, ghain Rihana, Maghtab, etc., *Gozo*, at Pergla, Xaghra, nadur, Kala, Dweira, Imgiar-ix-Xini etc. *Comino*. E. Sulla, French Honeysuckle. I Sulla. M. Sulla, Silla. Sulla is very extensively cultivated as a forage in the Maltese Islands, and its bright damask-red flowers are a feature of the landscape in March and April before mowing. It is justly called the "Prince of Forage plants", and is an important, perhaps the most important item, in the rotation of crops on out wheat lands, The form. *Albiflora*, with pure white flowers is often met with, at Boschetto, Imtahleb etc. but is not separately cultivated. The form. *Africana* or *gaulitana*, with erect stem, simple or slightly branched at the base, is cultivated more extensively, and in *Gozo* is the form exclusively grown. The form. *Diffusa* or *melitensis*, with erect and ascending stems, much branched

at the base and partly prostrate, and shorter, is frequently grown in the western-part of Malta. It produces a forage of finer quality, with softer and more slender stems. The form. *Prostrata* or *italica*, recently introduced from Italy, is even more prostrate and branched, with lower leaves having usually round leaflets, developing ascending stems just before flowering and producing a forage of fine quality.

#### CICER (Tourn.) L.

Herbs with pinnate leaves, and solitary flowers on axillary peduncles. Calyx broadly and obliquely campanulate, slightly gibbose at the base, with sub-equal teeth. Corolla with rounded standard enclosing the other petals. Legume ovate, bladder-like, shortly beaked. Seeds 1 or 2, globose, beaked, with a pubescent hilum. Species 7, natives of south-eastern Europe and Western Asia.

CICER ARIETINUM L. Plant annual, hairy and glandular, viscid, with an erect branched stem, 2-5 diameter high. Leaves with short petiole, imparipinnate, with 3-7 pairs of oval or oblong leaflets, acutely serrated. Stipules semi-sagittate, toothed. Peduncles much shorter than the leaf, jointed, with a bracteole about their middle. Teeth of calyx lanceolate-acute. Corolla purplish-blue or white, hardly longer than the calyx. Legumes pendulous, hairy. Seeds yellow or black or brown. (A) Said to be native of the Caspian region, and extensively cultivated throughout the Mediterranean region. April-May. Cultivated; the seeds being often consumed green as a vegetable, or dry as forage; they are also largely used roasted as a substitute for coffee, or mixed with it instead of chicory. F. Chik-pea, Gram, Garavance. It. Ceci. M. Cicri.

#### PISUM (Tourn.) L.

Flowers racemose or rarely solitary, on axillary peduncles. Calyx campanulate, oblique and almost bilabiate, with the two upper teeth shorter and farther apart. Corolla with a broad round or obovate standard, longer than the other petals; wings adherent to the keel. Style grooved on its lower surface, keeled and villose on its upper surface. Legumes linear, more or less compressed. Seeds many, globose and angular. Includes 3 species natives of the Mediterranean region, and the region of the Danube.

PISUM SATIVUM L. Plant annual glabrous and glaucous, with prostrate or climbing stems 3-15 diameter long. Leaves petiolate, paripinnate, with 1-3 pairs of oval or oblong leaflets, the petiole terminating in a branched tendril. Stipules large ovate. Peduncle jointed to the pedicel of the flower, bearing 1 or 2, rarely more flowers, and often terminating in an awn. Teeth of calyx acuminate, the lower 2 broadly lanceolate. Corolla white, rarely flushed violet; standard large, obovate-emarginate. Legumes linear oblong, at first flat, and then almost cylindrical, subcoriaceous, or much larger tender and eatable (form: *macrocarpum* Ser. in D.C.) (mangetout pea). Plant sometimes dwarf (form. *Humile* Mill.) (A) Native of the Mediterranean region, the region of the

Danube, Caucasus. March-May. Cultivated extensively as a vegetable. E. Pea. I. Pisello. M. Piselli-Pisum comune Clav.

Var. *arvense* L. Leaves with 1-3 pairs of leaflets. Peducles about as long as the stipules, with only one flower 15-20 mm long. Legume 4-6 cm long, with seeds adjoining and therefore angular-cuboid, smooth, variegated. March-May. Frequent in fields among growing crops of *Lathyrus Ochrus*. *Malta*, Ta Baldu, Rabato, Dingli, Bahria etc; Gozo, Sannat, Ghainsielem. More or less naturalised.

Var. *elatus* M.B. Leaves usually with 2-3 pairs of leaflets. Peduncles much longer than the stipules, bearing 1-3 flowers, 20-30 mm long. Legume 5-7 cm long, with seeds farther apart, and therefore round, almost smooth or minutely granular, black or variegated. Frequent in fields of *Lathyrus Ochrus* and *Vicia sativa*. *Malta*, Boschetto, Dingli, Siggiewi, Attard, Hemsia etc. Often naturalised also in fields of Sulla.

### LATHYRUS (Tourn.) L.

Wings of corolla free, or slightly adherent to the keel. Style more or less spathulate at the apex, papillose and hairy on the dorsal surface. The rest as in *Pisum*. Includes about 100 species, mostly natives of the northern hemisphere, a few being found on the hilly temperate regions of tropical Africa and of South America.

LATHYRUS APHACA L. Plant annual, glabrous, glaucous green, with angular slender climbing stems 2-5 diameter. Stipules large ovate, abrupt, with two divergent lobes at the base. Leaves reduced to a tendril. Peduncle axillary, longer than the tendril, bearing one flower rarely two, on a very short pedicel or joint furnished with a bracteole. Teeth of calyx linear-lanceolate, acute, twice as long as the tube. Corolla yellow, twice as long as the calyx. Legume linear, somewhat curved, strongly veined, 2-3 cm long. Seeds oval, compressed, smooth, reddish brown. (A) Mediterranean region, Central Europe and the Caucasus; naturalised elsewhere. March-May. Frequent in gardens, in fields among growing crops, in valleys and on rocky and waste lands, in *Malta* and Gozo. E. yellow-Vetchling. I. Mullaghera, Fior-galletto, Vetriolo. M. Porvina.

The form *affinis* Guss., with more robust habit, cordate-hastate stipules, and teeth of calyx not longer than the tube, is frequent in gardens and among growing corps.

LATHYRUS OCHRUS (L). D.C. Plant annual, glabrous, glaucous green, with winged decumbent or climbing stems 3-8 diameter long. Lower and middle leaves reduced to the flattened petiole or phyllodium, terminating usually in a branched tendril, and without stipules. Upper leaves with 1 or 2 pairs of leaflets, and with semi-hastate stipules. Peduncles axillary, one-flowered, awnless, jointed about its middle, much shorter than the leaf. Teeth of calyx triangular-lanceolate about as long as the tube. Corolla at least twice as long as the calyx, with the standard having one gibbosity on each side. Legume



linear-oblong, about 6 cm long, with two membraneous wings along the dorsal suture. Seeds globose, smooth, yellowish brown. (A) Mediterranean region. March-May. Extensively cultivated in *Malta*, *Gozo* and *Comino*, for the sake of its foliage and seeds, used as forage. A real native; met with here and there, especially in valleys and on uncultivated rocky wastes in *Malta*, *Gozo* and *Comino*. E. White-Vetch, Chickling Vetch. I. Orbiglio, Veccia bianca. M. Gilbiena bajda.

The form: petiolaris rouy, of very dwarf habit, with all leaves reduced to a phyllode, is met with in arid localities and exposed situations.

**LATHYRUS ARTICULATUS L.** Plant annual, glabrous, with winged climbing stems 2-10 diameter long. Lower leaves reduced to a flattened lanceolate petiole or phyllode, without stipules. The other leaves with petiole narrowly winged and 1-5 pairs of linear or oblong leaflets, and with two small semi hastate stipules, the petiole terminating in a branched tendril. Peduncles axillary, awned or awnless, equal to the leaf or longer, with 1-5 flowers. Teeth of calyx acute, not longer than the tube. Corolla u.s. thrice as long as the calyx, with purple standard and bluish wings and keel. Legumes linear-oblong, 4-6 cm long, grooved along the dorsal suture. Seeds ovoid, truncated, variegated. (A) Mediterranean region, Madeira.-*Lathyrus auriculatus* Bert.-*Lathyrus tenuifolius* Desf. I. Cicerchia porporina. M. Gilbiena tas-serp. March-May. Frequent and often common among growing crops, in valleys and on uncultivated ground, in *Malta*, *Gozo* and *Comino*.

Var. *Clymenum* L. Leaflets of upper leaves broader; style prolonged in an awl-shaped reflexed appendix; standard mucronate. With the species at Boschetto, Wied Kirda, wied Encita, Wardija, Pualet etc. in *Malta*, and at *Gozo* (Ramla), and *Comino*.

**LATHYRUS ANNUUS L.** Plant annual, glabrous, with stem winged in its upper parts, 5-15 diameter long. Stipules very narrow, semi-sagittate. Leaves with one pair of long linear-lanceolate leaflets, the upper leaves terminating in a branched tendril. Petioles narrowly winged. Peduncles not longer than the leaves, usually shorter, bearing 1 or 2 yellow or orange-coloured flowers. Teeth of calyx acuminate, equal to the tube. Corolla 2-3 times as long as the calyx. Legumes linear-oblong, grooved along the suture, glabrous, with 6 seeds. Seeds angular, roughly tubercled. (A) Mediterranean region, as far as Abyssinia, Persia, the Caspian region, Madeira, Canaries. April-May. The form *aurantiacus* Loser. With peduncles bearing two or three large orange-coloured flowers is found at Ghajn il Gbira (*Malta*), but is rare. The form *multiflorus* tin. Ex Lojac, also rare, with four or five flowers; on the same peduncle, smaller and coloured yellow or pale yellow, is met with in fields at Attard.

**LATHYRUS CICERA L.** Plant annual, glabrous glaucous green, with narrowly winged decumbent or climbing stems 2-6 diameter long. Leaves with only one pair of leaflets, rarely with 2 pairs, linear-lanceolate, acuminate, the upper leaves terminating in a branched tendril, with petioles narrowly winged. Peduncles always one-flowered. Stipules semisagittate-lanceolate, narrow.

Teeth of calyx lanceolate-acuminate, about twice as long as the tube. Corolla large or medium, red or purplish red. Legumes oblong or ovate-rhomboid, compressed, 3-5 cm long, with 3 to 5 seeds, which are angular, smooth, ash-coloured, spotted dark brown (A) Mediterranean region. Central Europe, Caucasus, Abyssinia, Canaries, North western Africa, Chili; naturalised elsewhere. March-April. Frequent and often common in fields among growing crops, in valleys and on uncultivated ground and rocky wastes in *Malta* and *Gozo*, e. Flat-poddes Vetch. I. Cicerchia. M. Gilbiena tas-serp.

Var. *sativus* L. Corolla rose, sky-blue or white, (usually sky-blue in local plants), larger than in the typical form. Leaflets u.s. acuminate; legumes broader, with two broad membraneous wings along the dorsal suture. February-April. Cultivated as a forage crop in *Gozo*, and often found naturalised as at Ta Harrix and Wied Bingemma. E. Chickling Vetch. M. Favetta, Cicciarda.

Var. *gorgoni* Parl. Leaflets oblong-lanceolate, mucronate. Corolla reddish yellow, 2 or 3 times as long as the calyx. Legumes as in the typical form. February-April. *Malta*, rare, near Addolorata Cemetery and at Boschetto, *Gozo*, very rare, at Wied Bingemma near Nadur.-*Lathyrus amoenus* Fenzl.

**LATHYRUS SETIFOLIUS** L. Plant annual, glabrous, with decumbent or ascending stems 2-6 diameter long. Stipules almost linear, semisagittate. Leaves with one pair of linear or linear-lanceolate, mucronate, leaflets, the petiole in the upper leaves terminating in a tendril usually branched. Peduncle one-flowered shorter than the leaf, with or without a bracteole at the joint, which is close to the flower. Teeth of calyx lanceolate acuminate, slightly longer than the tube. Corolla brick red, 8-11 mm long. Legumes oblong, stipitate, reticulate, pubescent along the margins, 25-30 mm long, with 2 or 3 globose, scabrous and granulose seeds. (A) South Europe, Hungary, South Russia, Asia Minor, Algeria. April. *Malta*, very rare, in certain quarries at Halluka.

**LATHYRUS SPHAERISUC** Retx. Plant annual, glaucous green, usually glabrous, with erect or ascending stems 1-6 diameter long. Stipules u.s. Leaves with one pair of linear-ensiform leaflets, mucronate, the petiole of the upper leaves terminating usually in a short simple tendril. Peduncle one-flowered not longer than the petiole, jointed about its middle, and furnished with an awn, usually long. Teeth of calyx lanceolate-acuminate, slightly longer than the tube. Corolla red, 10-13 mm long, as long as the awn or longer. Legume linear, 4-6 cm long, with longitudinal veins. Seeds globose or slightly angular, smooth or slightly granulose. (A) Central and South Europe, North Africa, Caucasus, India, Abyssinia, Madeira; naturalised elsewhere. March-May. *Malta*, rather rare, at Imghieret, Addolorata Cemetery, Verdala Park, Boschetto, Cneina and marsa. The form: *pilosus* Ser. in D.C. with hairy foliage is frequent in Verdala Park. The form *neapolitanus* Ten.-*Lanthyrus controversus* Loret et Barr., is met with in Verdala Park and Boschetto-*Lathyrus coccineus* All.-*L. angulatus* L. Mant.

LATHYRUS INCONSPICUUS L. Plant annual, with erect stems 1-4 diameter long. Leaves and stipules u.s. Upper leaves furnished with a simple tendril twice as long as the petiole. Peduncles very short, awnless, one-flowered, jointed near their base with 2 deciduous bracteoles. Calyx u.s. small. Corolla small, lilac or whitish. Legumes u.s. but shorter and broader, veins not prominent, usually pubescent. Seeds u.s. (A) Mediterranean region, as far as Afghanistan, February-April. *Malta*, very rare, Verdala Park-Lathyrus axillaris L.

Var. erectus Lagasca. Petiole of upper leaves furnished only with a short awn. Corolla equal to or slightly longer than the calyx. Legumes pubescent or hairy. *Malta*, rare, Addolorata Cemetery.

LATHYRUS ODORATUS L. The Sweet Pea, is very frequently cultivated in gardens, and is often met with as a garden-escape, but always dies out.

#### VICIA (Tourn.) L.

Herbs with pinnate leaves often climbing. Stipules semi-sagittate. Flowers axillary, solitary, or in small clusters, or in racemes. Teeth of calyx subequal, or the two upper teeth shorter in a bilabiate calyx. Corolla with emarginate or oblong standard, with wings adherent to the keel. Stamens diadelphous. Style filiform or slightly compressed in its upper part, with a capitate stigma, surrounded with hairs just below it, or rarely hairy on the dorsal aspect, or smooth. Legume generally shortly stipitate, with few or many seeds. Includes about 125 species, natives of the temperate regions of the northern hemisphere and of South America.

VICIA FABA L. Plant annual, glabrous and glaucous, with erect, thick, quadrangular stems 5-8 diameter high. Stipules semisagittate, oval, toothed and acuminate, with a nectary shaped like a purplish spot. Lower leaves with one pair of large leaflets, upper leaves with 2 to 4 pairs, rather fleshy, elliptical or oblong, mucronate, the petiole of the leaf terminating in a pointed pretabearance. Flowers large, sweet-scented, grouped 2-5 in subsessile racemes. Upper teeth of calyx shortened and triangular, lower teeth lanceolate about as long as the tube. Corolla white or veined dark, with a large dark purple spot on each wing. Legumes linear, cylindrical, compressed, hairy, at first fleshy and then coriaceous and black. (A) Probably native of Northern Persia; extensively cultivated in most temperate countries. February-May.-Faba vulgaris Moench. E. Broad Bean or Common Bean. I. Fava. M. Fula.

The typical form has a pod with 3 to 5 or 6 broad flat beans white or violet-blue. The form: longissima, has a pod with 6 to 10 or 12 broad white or violet-blue beans, usually with a narrow rim, and never close together in the pod. The form: brachycarpa has short broad pods with 1 to 2, rarely 3, very large broad beans, quite flat with a narrow rim and usually of a dark violet colour, almost black or even black. In all these pods are pendulous.

The form: *erecta* has the same habit, but the pods are more numerous, 2-6 in a cluster erect, short, and smaller, with 2 to 4 beans of the same appearance as in the typical form, but smaller, and white or violet-blue. E. July bean. I. Mezzafava. M. Mezzafava.

The form: *equina*, is a smaller plant, more bushy and clustered, with 2 or 3 seeds, rarely 4, much smaller than in the preceding form, less compressed and almost oblong, usually white, or brown or light violet. E. horse-bean. I. Fava *equina*, Fava *muletta*. M. Favetta.

**VICIA NARBONENSIS L.** Plant annual, erect or semi-erect, green, sparsely hairy, with stems 2-5 diameter high. Leaves with oval or elliptical entire leaflets; the upper leaves with 4 or rarely 5 leaflets, and with the petiole finishing in a tendril. The stipules semi-sagittate and semiorbicular. Calyx u.s. Corolla purplish violet. Flowers solitary or geminate, subsessile. Legume linear compressed, 5-7 cm long, dark brown or black, glabrous with tooth-like tubercles along the sutures. Seeds globose, smooth, dark brown or black. (A) Mediterranean region, as far as the region of the Danube and the Caucasus. March-April. *Malta*, rare, at Halluka, Tarxien, Ghirghenti and Marsa.- Faba *narbonensis* Schur. M. *Gilbiena hoxna*. Since about a decade, now frequently cultivated as a field forage crop.

Var. *serratifolia* Jacq. Upper leaves with 6 or rarely more leaflets, acutely toothed along the upper forming a sessile or subsessile raceme. *Malta* rare, at Ghirghenti. Cultivated with the species and more frequently.

**VICIA LUTEA L.** Plant annual with ascending or climbing stems 2-6 diameter long. Leaves somewhat hairy, with acute or obtuse, and mucronate leaflets, obovate in the lower leaves and oblong or linear and in 6 or 7 pairs in the upper leaves. Flowers solitary or rarely geminate. Teeth of calyx lanceolate-acuminate, the lower ones longer than the tube, corolla yellow. Legumes hirsute with long hairs on a thick base. Seeds globose dark purple. (A) Mediterranean region, Central Europe, Caucasus, Canaries. The typical form not yet found. E. Yellow-flowered Vetch.

Var. *hirta* Ralb. Plant hirsute or very hirsute, and more robust. Upper leaves with 8-12 pairs of leaflets. Corolla usually pale yellow, but may be reddish or purplish blue. *Vicia lutea* var. *pallidiflora* Ser in D.C. Very rare, *Malta* at Addolorata Cemetery. The local plants belong to the form: *hirsutissima* Cyrlex Mart., being very hirsute, with pale yellow flowers. April.

**VICIA PEREGRINA L.** Plant annual, with few applied hairs, and erect, decumbent or climbing stems 2-5 diameter long. Leaves with 2-6 pairs of linear truncated or emarginate and mucronate leaflets; upper leaves terminating in a branched tendril. Stipules semihastate and entire. Flowers solitary; calyx hairy with acuminate teeth; corolla purplish, twice as long as the calyx. Legumes stipitate, rarely glabrous, usually densely covered with applied hairs, pendulous or erect, oblong, 3-4 cm long. Seeds smooth, angular or globose, spotted grey and black. (A) Mediterranean region as far

as the Caucasus and India. February-April. *Malta* rather rare, at Boscehtto, Wied Encita, Addolorata Cemetery.

**VICIA SATIVA L.** Plant annual, more or less hairy, with erect, decumbent, or partly climbing stems 1 to 6 diameter long. Stipules semihastate, usually toothed and with a black or purple spot-like nectary. Lower leaves with 2-4 pairs of obcordate or obovate leaflets, mucronate; upper leaves with 5-7 pairs of narrower and longer leaflets, truncated or emarginate or oblong, also mucronate. Flowers sessile, solitary or geminate. Calyx glabrous or hairy, with 5 subequal acuminate teeth about as long as the tube, Corolla violet, rarely rosy, white, or crimson. Legumes sessile, glabrous or slightly pubescent, linear, compressed, black or dark brown. Seeds globose or oblong-truncated, dark, smooth, often splashed grey or yellowish. (A) Europe and the whole Mediterranean region as far as Abyssinia, the Caucasus and Afghanistan, Madeira, naturalised elsewhere. February-May. Very common on cultivated and uncultivated land, valleys, among growing crops etc. in *Malta*, *Gozo* and *Comino*. The form: *alba* Moench with pure white flowers is frequently met with on cultivated land. The form: *rubra* mihi. Is rarely met with on uncultivated land; it has red flowers. E. Vetch or Tare. I. Veccia. M. *Gilbiena seuda*. Extensively cultivated in *Malta*, *Gozo* and *Comino*, as forage both green and dry, and for its seeds.-*Vicia communis* Rouy.-*V. vulgaris* Gr et Godr. The cultivated plant is usually more robust, with longer pods.-*V. macrocarpa* Moris.

Var. *maculata* Presl. Leaflets of lower leaves orbicular or obovate-cuneate; leaflets of upper leaves obcordate and emarginate. Calyx with purple spots. Legumes black and smaller. Frequent on uncultivated land etc. in *Malta*, *Gozo* and *Comino*.

Var. *heterophylla* Presl. Leaflets of lower leaves obovate marginate, those of the upper obtuse and narrowly lanceolate or linear, rarely emarginate. Plant slender with small black legumes. With the preceding in valleys and on rocky wastes.

Var. *cuneata* Guss. Plant smaller, slender, and more hairy. Leaves mostly with obcordate or oblong-cuneate leaflets, deeply emarginate. Flowers purplish, less than 1 cm long. Legumes u.s.-*Vicia nebrodensis* Huet. In arid localities and on shallow, rocky soils; very common.

Var. *amphicarpa* Dorthes. Plant u.s. slender and prostrate. Legumes produced also on underground leafless stolous from apetalous flowers, the underground legumes being very short, oval, whitish usually one-seeded. *Malta*, at Boschetto, in the farm "Ta Rapa" and in the neighbouring lands "Laroca".

**VICIA BITHYNICA (L).** Plant annual, glabrous or hairy, with decumbent or climbing stems 2-6 diameter long. Stipules large, semisagittate, deeply toothed. Lower leaves with 1 to 2 pairs of oval leaflets; the upper with 2 to 3 pairs of oblong or lanceolate mucronate leaflets. Flowers axillary, 1 to 3 on a short peduncle not longer than the leaf, usually much shorter. Calyx hirsute,

with acuminate teeth subequal to the calyx. Corolla purple about twice as long as the calyx. Legumes linear, compressed, hairy, 3-5 cm long, with globose seeds (A) Mediterranean region and Western Europe, Caucasus. April *Malta*, very rare, at Ghirghenti, also at San Antonio Gardens and Attard, probably accidental-Lathyrus bithynicus L.

VICIA ONOBRYCHIOIDES L. Plant perennial, glabrous or hairy. Stems mostly climbing, slender, 3-6 diameter long. Stipules half-hastate, entire or toothed. Leaves with 4-10 pairs of linear leaflets, obtuse, mucronate. Teeth of calyx all hairy, the upper two short and reflexed, the lower acuminate longer, equal to the tube. Corolla purplish violet. Flowers many, in axillary racemes much longer than the leaves. Legumes oblong-linear, compressed, glabrous, attenuated at the base, about 3 cm long, with 6-10 globose seeds. (P) South Europe and North Africa. March-April. *Malta*, at San Antonio Gardens and other gardens in the neighbourhood. Rare, probably accidental.

VICIA VILLOSA Roth. Plant annual or biennial, more or less villose, with decumbent or partly climbing stems 2-7 diameter long. Stipules linear or lanceolate, half-hastate in the middle part of the stem. Leaves with 4 to 10 pairs of mucronate leaflets. Flowers 4 or more in axillary racemes equal to or longer than the leaf. Upper teeth of calyx very short and triangular, the lower lanceolate and awn-like. Calyx gibbose at the base. Corolla violet or purplish violet, or bluish at the apex, rarely entirely white; standard with a claw about twice as long as the limb. Legumes oblong-rhomboid, glabrous, with 2 to 8 seeds. (A) or (B) Mediterranean region, Central Europe and the Caucasus.-*Vicia unguiculata* Clavaud-V. *polyphylla* W. et K. non Desf.

Var. *dasycarpa* Ten. Plant pubescent or almost glabrous. Leaves with 6 to 10 pairs of oblong-lanceolate leaflets. Racemes longer than the leaves, dense and many-flowered, with the flowers 12-15 mm long, purplish violet, rarely white.-*Vicia glabrescens* Heim. *Malta*, rare; among growing crops in fields at Attard. March-May.

Var. *Pseudo-cracca* Bert. Plant with applied hairs or almost glabrous. Leaflets oblong or lanceolate, obtuse. Racemes loose, rarely with more than 10 flowers, usually reduced to 5 or less, 17-18 mm long, pale-blue, rarely pale-yellow or white. *Malta*, rare, at Wied Ghomor and Marsa, according to Delicata and Gulia. February-May.

VICIA LEUCANTHA Biv. Plant annual, pubescent, with slender climbing stems 1-10 diameter long. Stipules semilunar and laciniate. Leaves subsessile with oblong, obtuse, mucronate leaflets, the upper with 8 to 9 pairs, and their petiole terminating in a branched tendril. Racemes about as long as the leaves or shorter, with 2 to 12 flowers. Teeth of calyx subequal, linear, ciliated, longer than the tube. Corolla pale rose, about twice as long as the calyx, with a style hairy below the stigma. Legumes oblong-rhomboid, at first hairy then glabrous, 20-25 cm long, terminating in a short beak, with 5 or 6 seeds, which are globose, somewhat compressed. (A) Italy, Sardegna, Sicily, Dalmatia, Tunisia, Algeria. March-April. In valleys and cool herbaceous localities, frequent but not common. *Malta*, Ta Baldu, Imtahleb, Wied Balluta,

Wied Babu, Makluba, Wied Zembak, Wied il Ghasfurja, Boschetto, Ghain il Cbira, Ghirghenti, Wied Encita, etc. Gozo, Xlendi, Imgiar ix-Xini.-*Vicia Bivonca* Raf.-*Ervum agrigentinum* Guss.

**VICIA TETRASPERMA (L).** Moench. Plant annual glabrous or slightly hairy, with slender climbing stems, 2 to 6 diameter long. Stipules linear, entire, simple or half-hastate. Upper leaves with 3 to 6 pairs of linear leaflets, obtuse and mucronate, and terminating in a tendril, simple or with 2 or 3 branches. Peduncles capillary, axillary, awnless, subequal to the leaf, with 1 or 2 flowers. Calyx hairy, with triangular teeth shorter than the tube. Corolla pale-blue, twice or thrice as long as the calyx. Legumes linear, rounded and obtuse at the apex, glabrous or rarely pubescent, usually with four globulose seeds. (A) Mediterranean region, Central Europe, Caucasus as far as Japan, Canaries, naturalised elsewhere. February-May. *Malta*, on uncultivated land and in moist valleys, frequent but not common, at Boschetto, Verdala Park, Wied Encita, Wied Gherzuma, Wied il Ghasel, etc. Gozo, Wied il Lunziata, Xlendi and Imgiar ix-Xini. The form: *ericropa* Gr. Et Godr. With pubescent pod is met with at Boschetto and Wied Encita.-*Vicia gemella* Crantz.-*Ervum tetraspermum* L.

Var. *gracilis* Lois. Leaves with very narrow and acute leaflets. Peduncles at least twice as long as the leaf, with 2 to 5 flowers. Legumes usually glabrous, with 5 to 6 seeds. February-May. With the species at Wied Encita, Boschetto, Addolorata Cemetery; etc.-*Ervum tenuissimum* Pers.-*E. gracile* D.C.

**VICIA HIRSUTA (L)** S. F. Gray. Plant annual u.s., but rather more stiff, and more or less hirsute, 2 to 10 diameter long. Lower leaves with 2 to 4 pairs of ovate leaflets: the upper with 4 to 8 pairs of lanceolate or linear leaflets, truncated and mucronate. Tendrils u.s. Peduncles equal to or shorter than the leaf, with 1 to 6 flowers. Teeth of calyx subequal, linear-lanceolate slightly longer than the tube. Corolla white or pale blue, a little longer than the calyx; style glabrous below the stigma. Legume oblong-rhomboid, compressed, acute, 7-10 mm long, hairy, black at maturity, with one to two globular seeds, with a large hilum. (A) Europe, North Africa, Asia as far as North India and Japan, Madeira, Abyssinia; naturalised elsewhere. *Malta*, rare, at Wied Encita. February-May. First found in May 1916-*Ervum hirsutum* L.-*Cracca minor* Gr. Et Godr. E. Common Tare, Hairy Vetch.

**VICIA ERVILIA (L)** Willd. Plant annual, almost glabrous, with stiff erect stems 2 to 4 diameter high. Stipules half-hastate, the upper almost entire, the lower deeply toothed or lacinate. Leaves with 8-10 pairs of oblong-lanceolate, emarginate or obtuse, and mucronate leaflets. Peduncles axillary, furnished with an awn, shorter than the leaf, bearing 2 to 4 flowers. Teeth of calyx subequal, awl-shaped, longer than the tube. Corolla twice as long as the calyx, bluish white veined violet. Legumes linear oblong, torulose, glabrous, with a round apex, shortly beaked, having 2 to 4 angular seeds of oval shape, with a minute hilum. (A) Mediterranean region, Central Europe and the Caucasus. March-May. Extensively cultivated in *Malta*, *Gozo* and *Comino*, as a forage plant, and often met with naturalised on uncultivated ground,

rocky wastes, and along the walls of fields and country-roads.-*Ervum Ervilia* L.-*Ervilia sativa* Lk. E. Bitter Vetch I. Mochi, Capogirlo, Veccioli. M. Zofsfa. The seeds are considered poisonous for pigs; and the whole plant when the pods are approaching maturity and are still moist, is considered dangerous also for cattle.

**VICIA LENS (L).** Coss et Germ. Plant annual pubescent or hirsute, with erect stems 1- 4 diameter high. Lower leaves with 2-3 pairs and the upper with 4-7 pairs of leaflets; obovate cuneate in the lower leaves, lanceolate or linear in the upper, in these last the petiole terminating in an awn or a tendril, usually simple. Stipules lanceolate. Peduncles about as long as the leaf or shorter with 1 to 3 flowers. Teeth of calyx lesniform, ciliated, 5 to 6 times as long as the tube and about as long as the corolla which is whitish, veined violet. Legumes rhomboid, compressed, glabrous, with a short beak 12-15 mm long, fawn-coloured at maturity, with 1 or 2 large lenticular seeds, 5-7 mm in diameter, greenish yellow or reddish. (A) Mediterranean region, as far as the Caucasus; naturalised elsewhere. March-May. Cultivate in *Malta* and *Gozo*, usually as a catch crop or along with wheat. The form *disperma* Fiori.-*Ervum lens* var *monor* Ten. producing smaller seeds usually darker, and with rounded margin, is also cultivated. *Ervum Lens* L.-*Lens esculenta* Moench. E. Lentil. I. Lenticchia M. Ghats or Ghazz.

#### PHASEOLUS (Tourn.) L.

Voluble herbs with trifoliate leaves, or imparipinnate, with entire leaflets. Flowers in axillary racemes. Calyx campanulate, almost bilabiate, with short teeth, the upper two of which more or less connate. Standard subsessile, wings adhering to the keel, the keel terminating in a long beak coiled spirally. Style dilated at the apex, with an irregular almost semilunar crest-like stigma. Legume linear, straight or curved, compressed or cylindrical, with several seeds more or less reniform or oblong. Includes about 150 species and well-marked varieties, natives mostly of the warmer regions of the globe.

**PHASEOLUS VULGARIS L.** Plant annual, scabrous and slightly pubescent, dwarf, with stems voluble only at the top or not voluble (Form *nanus* L.), or tall up to 2 m with voluble stems. Stipules oblong. Leaves trifoliolate with large acuminate leaflets, the central rhomboid and the lateral obliquely ovate, all with a hairy petiole having scale-like stipules at the base. Racemes shorter than the leaves, with geminate flowers on rather long pedicels, each with two small bracteoles under the calyx. Corolla white or lilac. Legumes smooth, pendulous, beaked, straight or slightly curved. Native probably of South America; extensively cultivated in many varieties. April-September. E. French bean. I. Fagiuolo. M. Fazoloa.

*Phaseolus lunatus* L is also occasionally cultivated as a dry legume.

### ORD. MYRTIFLORAE.



## MYRTACEAE.

Trees and shrubs mostly evergreen, with simple coriaceous leaves, alternate or opposed, often with volatile oil glands, and without stipules. Flowers axillary or terminal, singly or in heads or panicles; sometimes sessile forming a dense terminal spike, through which the shoot continues its growth: hermaphrodite, epigynous. Calyx 5 segments sometimes deciduous: corolla normally 5 petals inserted on the segments of the calyx. Stamens indefinite, epigynous. Fruit a berry; seeds many and small. Most Myrtaceae are highly aromatic owing to the presence of oil glands in all green parts.

The family includes 72 genera and about 2,500 species, distributed mostly in the tropical and subtropical regions of both hemispheres.

### MYRTUS (Tourn.) L.

Calyx with 5 segments; petals 5 inserted on the margin of a ring around the calyx. Stamens numerous inserted on the same ring. Ovary inferior 2-3 locular, with many ovules. Style 1, with one entire stigma. Berry 2-3 locular, many seeds. Leaves entire, opposed, dotted on both surfaces with dark minute oil glands. Species about 60, of which only one belongs to the Mediterranean region.

### MYRTUS COMMUNIS L.

An evergreen shrub about 2 m high. Leaves coriaceous, very persistent, smooth and of a light shining green colour on the upper surface. Flowers solitary, and axillary, with a white corolla. (P) South Europe, West Asia and North Africa. June-July. Wied Gherzuma, Boschetto, Wied Hazrun. Rare. E. Myrtle. I. Mirto. M. Rihan.

The typical form has a calyx with acute lobes, an ovoid black blue berry, and the leaves are ovate (a. romana Hoffm.) or ovate-lanceolate, (b. lusitanica W.-M. acuta Mill) the branches may be erect instead of spreading (e. italica Mill.) to this last form belongs the native plant in Malta. The variety with white berries (d. leiocarpa Ten) is cultivated, and so also the form romana above mentioned as well as the variety B. tarentina L. (Mill) which has a calyx with rounded lobes, a globose black-blue berry, and hairy twigs.

The powdered leaves of the myrtle are used as an astringent, especially for sores in children.

## PUNICACEAE.

This small family consists of only one genus with two species, one of which is native of Socotra, and is rather a subfamily of Myrtaceae, from which it differs in the absence of aromatic principles in the green parts, in the leaves without dark dots, and in the conformation of the fruit, which is a large berry with a leathery rind, and with many angular seeds, each surrounded by a transparent

and juicy arill, which is the eatable part of the fruit. This type of fruit is called balausta or balaustrum.

### PUNICA (Tourn.) L.

Calyx with 5-7 segments. Petal 5-7, convolute in the bud, inserted on the throat of the calyx. Stamens numerous, inserted with the petals. Ovary inferior, having numerous loculi in two tiers, 5-9 in the upper and 3 in the lower, with many ovules. Style 1, stigma entire. Berry u.s.

PUNICA GRANATUM L. A small tree or shrub, very branched from the base, with a desquamating greyish or yellowish bark. Leaves deciduous, oblong, obtuse or subacute, light green, entire, opposed or collected in tufts at the extremities of the shorter twigs, which often terminate in a spine. Flowers red, terminal, solitary or united in twos or threes, many of them being unisexual or male, owing to the abortion or non development of the female organs. Fruit globose, large, surmounted by the persistent segments of the calyx. The rst u.s. (P) Native of the Eastern Mediterranean, but long naturalised all over the Mediterranean region. May-July. The typical form, with very acid fruits and yellowish or deep-red rind is half wild or self-sown in our valleys and ravines: other forms with sweet or slightly acid juice, whitish to deep red grains, and green to deep red rind, are cultivated E. Pomegranate. I. Melogranato. M. Rummien or Rimmien.

## LYTHRACEAE

Herbs annual or perennial, shrubs and small trees,. Leaves simple, entire, opposed alternate or whorled, without stipules. Flowers axillary or forming terminal racemes or spikes. Calyx monosepalous, free, tubular or campanulate. Corolla of 4-5 petals or more, inserted on the throat of the calyx, convolute in the bud. Stamens as many as the petals, or twice as many, or indefinite, inserted on the tube of the calyx. Ovary free, with 2 or more loculi; style single. Fruit a small capsule, sometimes becoming one-celled, with numerous minute exalbuminous seeds.

The family includes 21 genera with about 360 species, distributed mostly in the tropical regions of both hemispheres, a few herbaceous species inhabiting the temperate regions. Lythrum Salicaria a native of Europe is here cultivated in ponds, and is remarkable for its trimorphic flowers with stamens and styles of various lengths. It is used elsewhere for chronic gastritis and as an astringent for ulcerated varices.

LYTHRUM GRAEFFERI Ten. Stem prostrate or ascending (1-3 diameter), angular. Leaves glabrous, the lower oblong-elliptical. Calyx 6-7 mm long, with 12 subequal teeth. Petals 5-6, purplish red, 5-7 mm long. Stamens 12. (A) or (B) South Europe, Asia Minor, North Africa. April-June. Along water courses and in moist localities as at ghain Rihana, Wied Mula, Gneina, Puales, Wardia, Imtahleb, Wied Gherzuma. Fiddien in *Malta*, and at Wied il Lunziata in *Gozo*. L. maculatum Boiss. Et R.- L. flexuosum Lag.-L. Gussonei Presl.

Var. *Preslii* Guss. Has a more erect habit, with wingd stem, and lower leaves cordate-oblong. Flowers with 10 stamens. Rare, with the species at Gneina.

**LYTHRUM HYSSOPIFOLIA** L. Stem prostrate or ascending, 1-3 diameter. Leaves mostly alternate, glabrous, the lower linear-oblong, the upper linear-lanceolate. Calyx with 10-12 minute teeth, the outer teeth being lesiniform. Petals 5-6, half as long as the calyx, violet-pink. Stamens 5-6. (A) Rather frequent and sometimes common in valleys, and moist localities, along water courses, and even indries situations in *Malta* and *Gozo*. April-May. The species is broadly distributed all over the temperate regions of the world.

## OENOTHERACEAE (Onagraceae.)

Herbs or very rarely shrubs, with opposite and toothed-leaves without stipules, sometimes alternate or forming a rosette. Flowers in terminal racemes or spikes; hermaphrodite, actinomorphic, rarely zigomorphic. Calyx gamosepalous, adhering to the ovary, the limb terminating in 2 or 4 lobes connivent in the bud. Corolla occasionally wanting but usually consisting of as many petals as there are lobes in the calyx, and inserted on the throat of same. Stamens usually 8, sometimes 4 or 2, inserted with the petals. Ovary inferior, with one or two or four loculi, surmounted by a simple style divided into 1-4 stigmas. Fruit a capsule or sometimes an achene; seeds small exalbuminous. The family includes 22 genera and about 300 species, distributed in the temperate and tropical regions, especially in North America.

The Oenotheraceae are mucilaginous and astringent. The root of *Epilobium* contains tannic and gallic acids and is occasionally used in astringent decoctions and lotions, while the young shoots are eaten like *Asparagus*. Species of *Oenothera*, *Clarkia*, *Codetia*, *Gaura*, *Zauschneria* and *Fuchsia* are cultivated for ornament in gardens.

### EPILOBIUM L.

Herbs annual or perennial, sometimes woody at the base, with pink, violet or white flowers. Calyx prolonged in a tube above the ovary, with 4 lobes. Corolla of 4 petals. Stamens 8. Ovary inferior, 4 locular, with many ovules, and with 1 or 4 stigmas. Capsule 4-locular with loculicidal dehiscence containing numerous seeds furnished with pappus. Species about 50 distributed in the temperate and colder regions of both hemispheres.

**EPILOBIUM TETRAGONUM** L.-*E. virgatum* Kock.-*E. adnatum* Griseb. Stem usually simple, rising in a clump from a rootstock of short rosette-leaved shoots, about 1 m. high, quadrangular, glabrous, or slightly pubescent. Leaves lanceolate or linear-lanceolate, broader at the base, the lower leaves being opposed and toothed, the upper leaves alternate and narrower. Flowers axillary; petals pink, 5-12 mm long. Stigmas 4, erect and connivent. (A) (B) (P) Europe, Asia to Siberia, South Africa, North and South America, Australia.

Var. B. *Tournefortii* Michx.-E. *tetragonum* var. *grandiflorum* Salzm. Leaves all sessile and rounded at the base. Petals 20-25 mm long. Both the typical form and the variety are met with at Ghirghenti, Imtahleb, Fiddien, Bahria, Gnien il Gbir, San Martin, Gneina, Wied il Kliegha, Melleha, along water courses and in moist situations, but the variety is much more frequent. May-October.

**EPILOBIUM PARVIFLORUM** Schreb.-E. *pubescens* Roth-E. *cordatum* Biv. Plant pubescent or velvety, stems simple or slightly ramified, arising from a rootstock u.s. Leaves opposed, the upper ones alternate, ovate-oblong or ovate-lanceolate and cordate at the base, acute, hardly toothed, with a short petiole, the upper ones often sessile. Flowers axillary, at first erect, then spreading. Petals a little longer than the lobes of the calyx. Europe, Western Asia, North Africa. (P) April-September. Rare, at Imtahleb and Boschetto.

*Epilobium roseum* Schreb., has been found in gardens at Lia and Attard, probably imported accidentally with other seeds.

## ORD. UMBELLIFLORAE.

### ARALIACEAE.

Trees, shrubs, creepers, occasionally herbs, mostly with persistent foliage. Leaves simple, alternate, sometimes entire, but usually palmate, and often compound or digitate, or otherwise cut or divided, with petiole dilated at the base, but without real stipules. Flowers actinomorphic, small, in simple umbels which are solitary or paniced and without involucre. Calyx fused with the ovary, with 5 teeth. Petals 5, inserted round a fleshy ring on the ovary. Stamens 5, alternate with the petals. Styles 2, arising from the centre of the ring, sometimes united. Ovary 2-10 celled, each cell with one ovule. Fruit a berry or berry-like drupe with as many seeds as there are cells.

The family includes 38 genera and about 340 species distributed all over the world, especially in tropical regions. Many species are highly ornamental, but few are of any practical utility. *Fatsia* (*Aralia*) *papyrifera* is used for paper-making in China, and Ginseng (*Panax quinquefolium*) is highly prized as a general tonic in the same country.

### HEDERA (Tourn.) L.

Calyx indistinct, with 5 small teeth. Petals 5, reflexed. Stamens 5. Ovary semi-inferior 5-celled, each cell with one pendulous ovule. Style single and short, terminating in 5 minute stigmas. Fruit a berry or berry-like drupe with 2-3 softish nutlets. Species 2, one of which is Australia.

HEDERA HELIX L. Stem woody, much ramified, adherent to any support or to the ground, by means of numerous root-like structures (fulcra), which however are not present on the fertile branches. Leaves alternate, with a long petiole, coriaceous, persistent, smooth, and dark shining green on the upper surface, palmatilobed, with 3-5 lobes, sometimes almost triangular or deltoid. The leaves on the fertile branches are entire and ovate-acuminate. Flowers in simple umbels forming together a panicle. Petals greenish. Fruit top-shaped, black. (P) August-September. Europe, Asia as far as Japan, North Africa. E. Ivy. I Edera or Ellera. M. Liedna. Common on walls and rocks in valleys, Boschetto, Ghain il Cbira, Ghirghenti, Gneina, Imtahleb, Wardia etc. also in Gozo, and Comino.

The varieties *chrysocarpa* Walsh, with globose yellow fruits; the Algerian tree-like ivy (*arborea* Hort.) and certain variegated and variously cut-leaved sorts, are cultivated for ornament.

## UMBELLIFERAE.

Herbs, annual or perennial, rarely shrubs, with alternate leaves usually more or less divided into segments, often capillary. There are no stipules, but the petiole is dilated at the base or amplexical. Flowers small, epigynous, yellow, white or purplish, usually regular in terminal or lateral umbels, which are rarely simple or reduced to a globular head, but are generally united together into compound umbels, often with one or more bracts at the base of the umbel, forming the involucre, or at the base of the compound umbel forming the involucre, or at the base of both the simple and the compound umbel. Calyx united wholly with the ovary, and its presence is apparent only when its five small teeth surround the apex of the ovary. Petals 5, often emarginate or notched, and usually reflexed upwards at the tip, inserted around a fleshy ring or disk on the ovary. Stamens 5, alternating with the petals. Ovary inferior, bilocular, with one ovule in each cell. Styles 2, arising centrally from the disk. The fruit is a schizocarp, separating when ripe into two mericarps which are one-seeded and indehiscent, usually attached at their summit to a central axis or carpophore which may be either entire or bifid. Each mericarp or carpel, usually called seed, is marked on the outside or free surface with 5 ribs, forming longitudinal ridges on jugae, between which there are furrows called vallecule. These furrows may be subdivided into two by means of secondary jugae arising along the furrows. The ribs are occasionally expanded into membranous wings, or produced as hairs or hooks or tubercles. Underneath each vallecule there are usually one or more longitudinal channels called vittae filled with a resinous or oily substance. The embryo is small, embedded in a horny perisperm.

This is a very large and distinct family, consisting of 231 genera and about 1300 species, distributed mostly in the temperate regions and for the greater part in Europe and Asia. The Umbelliferae are very often aromatic plants, having volatile oils associated with sugary substances, or with resins, or even with powerful alkaloids. A few are used as food, others are used as condiment, and others yield oils, resins and other substances used in medicine and in the arts.

## SYNOPSIS OF TRIBES REPRESENTED IN OUR FLORA

1. ERYNGIEAE. Umbels simple, rarely compound and then irregular. Vittae wanting, Eryngium.
2. CHINOPHOREAE. Umbels compound: flowers monoecious. Female flowers sessile and solitary in secondary umbels. Fruit sunk in a cup-shaped cavity of the receptacle and surrounded by the pedicels of the male flowers. Echinophora.
3. SMYRNIEAE. Umbels compound, rarely simple. Flowers hermaphrodite or polygamous. Fruit oval or oblong, compressed laterally, and therefore with a narrow face. Vittae present. Bupleurum, Smyrnum, apium, Petroselinum, Ammi, Pimpinella, Cuminum, Ridolfia.
4. SCANDICEAE. Umbels compound. Flowers hermaphrodite. Fruit very oblong or linear, generally with a long beak at the apex, not winged, compressed laterally and with narrow face. Scandix, Anthriscus.
5. SESELINEAE. Umbels compound. Flowers u.s. Fruit oblong or globose-ovate, compressed dorsally and therefore almost round in transverse section and the mericarps have a broad face. Mericarp semi-cylindrical or lenticular, or with face (ventral side) concave or sulcate. Foeniculum, Kundmannia, Crithmum. Oenanthe.
6. PEUDEDANEAE. Umbels compound; flowers u.s. Fruit very compressed dorsally, with a broad margin, primary dorsal ribs filiform, the laterals expanded in wings forming the margin. Ferula, Tordylium.
7. DAUCEAE. Umbels compound; flowers u.s. Fruit oval, globose or oblong, compressed dorsally, or slightly compressed laterally, with secondary ribs often more prominent than the primary, and often furnished with wings or rigid hairs or spines.

Coriandrum Bifora, Daucus, Porilis.

### ERYNGIUM (Tourn.) L.

Leaves rigid, spinous, generally glaucous. Flowers white, rarely bluish, sessile, forming a head with a spinous bluish involucre. Petals erect, with incurved apex. Fruit ovoid or oblong, spiny or tubercular at least on the sides; mericarp with 5 ribs, vittae solitary or wanting. Carpophore wanting. Includes about 100 species native of temperate and tropical regions.

### ERYNGIUM MARITIMUM L.

Plant smooth, glaucous often bluish in its upper parts. Stem erect, striated, branched (2-6 diameter). Leaves very rigid, thick, reticulated, more or less trilobed, sinuated, spinous-toothed along the margin, the lower leaves with a

long petiole, the upper leaves sessile and amplexicaul. Flowers sessile in heads on a long peduncle, having 4-6 involucre bracts, about twice as long as they are broad, of oval shape, tri-toothed and spinous. Fruit with a thick margin. (P) In all sandy places along the sea-shore, in *Malta*, *Gozo* and *Comino*, frequent but nowhere common. June-September. South and Western Europe, Asia Minor, North Africa. E. Sea Holly, Sea Eryngo. I. Cacatreppola marina, Erba S. Pietro. M. Xeue ir-ramel. The roots and the tender shoots are aromatic and were sometimes used candied.

#### ECHINOHORA (Tourn.) L.

Leaves pinnatifid, often rigid and spinous. Flowers white or yellow. Fruit only one fertile in each secondary umbel, sunk in the cup-shaped pedicel, having only one mericarp fertile, with 5 indistinct ribs. Species 8, natives of South Europe, West Asia and North Africa.

#### ECHINOPHORA SPINOSA L.

Leaves pinnatifid rigid, with very spinous triangular segments. Umbels plane; flowers white, with glabrous petals. Involucre and involucre of 5-10 linear bracts. Stem erect, rigid, tortuous, branched. (P) June-September. Native of France, Spain, Italy, Sicily, Asia Minor and North Africa. On sandy shores, at Marfa (Ramla tal Armiel) in *Malta*, and at Ramla in *Gozo* Rare.

#### Bupleurum (Tourn.) L.

Plant smooth, more or less glaucous; leaves quite entire, linear, or ovate. Flowers yellow, in small umbels, with or without involucre. Calyx with indistinct limb. Petals yellow, incurved. Fruit subglobose or oblong; mericarps with 5 equidistant ribs, more or less prominent or even winged. Vittae may be wanting, or one or more in each furrow. Carpophore bifid. Includes about 60 species native of Europe, Asia and North Africa, one species being also native of South Africa.

#### BUPLEURUM ROTUNDIFOLIUM L.

Plant glabrous and glaucous. Stem erect, or ascending, striated, more or less branched, rarely simple (1-10 diameter). Leaves ovate or obovate, abruptly terminat in a short point; the lower leaves amplexicaul, the upper perfoliate. Umbel of 2-8 rays, without involucre. The secondary umbels with an involucre of 3-5 broad free bracts, elliptical or roundish, terminating in a short point, twice or thrice as long as the secondary umbel. Fruit almost smooth. (A) Native of Central and Southern Europe, Western Asia, Northern Africa, and naturalised in North America. The typical form is absent from the Maltese flora.

Var. subovatum Lk-B. intermedium Steud.-B. protractum H. et L. Upper leaves ovate with a rounded base, broader at the base than at the apex. Lower leaves 3-5 times long as broad. Umbels with 2-4 rays. Fruit granulose-reticulated. March-May. Frequent in fields especially in the western part of

*Malta*, rarer in valleys and on rocky wastes. Frequent also in *Gozo*, and *Comino*. E. Hare's-ear, Throw-wax M. Wiednet il fenech.

#### BUPLEURUM SEMICOMPOSITUM L.

Plant glabrous and glaucous; stem erect or prostrate, leafy, furrowed above branched (1-2 diameter). Leaves linear-lanceolate, acute or acuminate. Umbels of 2-5 rays, without involucre. Involucel of 5 bracts, linear or lanceolate, acuminate, longer than the secondary umbel. Fruit rugose. (A) Native of South Europe, West Asia and North Africa. The typical form with oblong fruit, has not been found in *Malta*.

Var. *glaucum* Rob. Et Cast. The bracts of the involucel are toothed along the margin, and scabrous along the keel but sometimes smooth. The fruit is subglobose-didymous. March-May. Rare or very rare. Between Curmi and Marsa.

#### SMYRNIUM (Tourn.) L.

Leaves divided, the superior sometimes entire. Flowers greenish yellow. Umbels compound, without involucre. Fruit subglobose, mericarps with 5 narrow ribs with several vittae in the furrows. Carpophore bifid. Species 6, native of Europe and of the Mediterranean region.

#### SMYRNIUM OLUSATRUM L.

Stem erect, cylindrical and striated below, angular and furrowed above, pithy and ramified (6-12 diameter). Upper leaves trifid, lower leaves 2-3 times trifid, smooth and aromatic. Umbels with 6-12 rays; involucels wanting or reduced to a linear bract. (B) February-April. South and Western Europe, Caucasus, Asia Minor, North Africa. Frequent and sometimes common in shaded places, along valleys, under Carob-trees, etc, in *Malta* and *Gozo*, rarer in *Comino*. E. Alexanders. I. Macerone, Smirnio. M. Carfus il hmir.

#### APIUM (Tourn.) L.

Leaves much divided. Umbels compound, with whitish flowers, without involucre or with an involucre of two or more bracts in biennial or perennial species. Fruit small, subglobose, with equidistant ribs. Carpophore entire, or just bifid at the apex. Species about 20 distributed all over the world.

#### APIUM GRAVEOLENS L.

Stem erect, thick, hollow, fluted, more or less branched (3-10 diameter). Leaves smooth, pinnatifid or trifid, with cuncate-ovate toothed segments. Umbels on a very short peduncle, almost sessile, partly opposite to the leaves, with 6-12 rays, and without involucre. Petals white, rounded at the base. Fruit very small, subglobose. (B) April-September. Europe, Caucasus, Asia Minor to India, North Africa, Abyssinia, South America.



Frequent along water-courses. Gneina, Wied Hazrun, ta Baldu, Imtahleb, Fiddien (*Malta*), and Xlendi (*Gozo*); also very commonly cultivated. E.. Celery. I. Sedano. M. Carfus.

#### PETROSELINUM Hoffm.

Leaves divided. Umbels compound without involucre or with one or two linear bracts; flowers white, greenish or pink, petals cordate at the base, incurved. Fruit ovoid, or globose-ovate, mericarps with 5 equidistant ribs; one vitta in each furrow; carpophore bifid. Species 6, natives of Central Europe and the Mediterranean region.

#### PETROSELINUM HORTENSE Hoffm.

Stem erect, striated (4-10 diameter) branched. Inferior leaves bipinnatifid, with broadly cuneate-oval segments, toothed and trifid, smooth. Upper leaves with narrower segments, and the uppermost simple or trifid, with linear segments. Umbels of 5-12 rays, without involucre of several linear setaceous bracts. Flowers greenish white. (B) Extensively cultivated or naturalised in most countries, but really native of Southern Europe and North Africa. April May. Along water-courses at Gneina, Ghirghenti, Gnien Ingrau, Wardia, apparently indigenous. Naturalised in many gardens, and at Wied il Lunziata (*Gozo*)-apium Petroselinum L.-P. sativum Hoffm.-Carum Petroselinum B. et H. E. Parsley. I. Prezzemolo. M. Tursin. The following forms are also cultivated: crispum D.C., with curled leaves; filicifolium mihi with fern-like leaves and linear segments; italicum mihi with large leaves, native of Ebohi.

#### PETROSELINUM AMMOIDES (L) Rehb. F.

Stem erect or ascending, striated, much branched from the base. Leaves bipinnatifid, glabrous, with linear or capillary segments, toothed or pinnatilobed; the uppermost leaves very small, trifid or entire. Umbels with 6-15 very irregular rays, without involucre. Secondary umbels with involucre of 5 bracts, of which 3 linear-setaceous, and 2 expanded or spatulate. (A) Native of south Europe and North Africa. March-June. Common everywhere in *Malta*; less frequent in *Gozo* and *Comino*.-Ptychotis ammoides Koch.-Seseli ammoides L.-S. verticillatum Desf.-Carum ammoides Arc.

#### AMI (Tourn.) L.

Leaves much divided. Umbels compound and usually concave, with involucre of pinnatifid bracts, and with similar involucre but smaller. Flowers white in the fresh state, and sometimes deep yellow when dry. Fruit ovoid, with pronounced equidistant ribs. One vitta in each furrow; carpophore split in two. Species 6 or 7, natives of the Mediterranean region, Abyssinia, and West Africa.

#### AMMI MAIUS L.

Plant glabrous. Stem erect, striated, branched from the base like a panicle (4-7 diameter). Leaves 1-3 pinnatifid, the lower with oval, lanceolate-linear segments, the upper with linear segments or laciniae. Umbels with many rays; involucre of many pinnatifid bracts, with linear or filiform segments. Involucel of several bracts which are entire lanceolate-linear or linear. (A) Central and South Europe, West Asia, North Africa, Abyssinia. April-June. Frequent and sometimes common in fields and valleys and on waste lands, in *Malta* and *Gozo*.

Var. a. *genuinum* Gr. Et Godr., with pinnatifid lower leaves having oval or lanceolate segments, serrated, and with cartilaginous margin; and var. b. *intermedium* D.C., with decompound lower leaves, with cuneiform segments, toothed or cut, are also found along with the typical form. E. Bull-wort. I. Rizzomolo, rindomolo. M. Dacra.

#### AMMI VISNAGA (L) Lam.

Plant glabrous; stem erect, striated, ramified above like a corymb. Leaves 2-3 pinnatifid, all with very narrow, linear or capillary segments. Umbels and involucre u.s. Involucel of several entire, linear, setaceous bracts. (A) South Europe, North Africa, West Asia, Canary Islands, Chili. May-October. Fields and waste grounds in *Malta*. Described as common by Delicata and Gulia, but not found again by others. E. Spanish Tooth-pick. I. Bisnaga or Usnaga.

The flowers of *Ammi majus* are used for their supposed quality of fertilizing the pomegranate tree, the flowers being tied in small nunches and attached to the twigs of the pomegranate in bloom. The stems are used to attach the caprifigs on the fig-tree in the process of caprification.

#### PIMPINELLA L.

Leaves trifid or 1-3 pinnatifid; flowers small in compound umbels, involucre and involucel wanting or very rarely represented by one linear bract. Petals cuneate or rounded at the base, with the apex incurved and depressed. Fruit globose or ovate, with marked quidistant ribs, and with 3 or more vittae in each furrow. Carpophore bifid. Species over 100 natives of the northern hemisphere, and a few of South America.

#### PIMPINELLA PEREGRINA L.

Plant more or less pubescent and biennial. Stem erect, cylindrical, branched (3-7 diameter). The first leaves are entire, the next are pinnatifid with rounded or oval segments toothed or cut; the upper leaves are pinnatifid with pinnatopartite segments, and short linear laciniae. Umbels with many rays: petals white: fruit hairy with erect hairs (B) South Europe, West Asia, and the Caucasus and Abyssinia. April-June. Frequent along the walls of fields and on waste lands in *Malta* and *Gozo*.-*Apium peregrinum* Crantz.-*Tragium peregrinum* Spreng. I. Tragoselino lappolino. M. Sensiela. Used to hang with the caprifigs on the fig-tree.

### PIMPINELLA ANISUM L.

Plant slightly pubescent or glabrous, and annual. Stem u.s. first leaves entire, rounded or cordate; the next trifid with cordate or cuneate segments, toothed or cut; the upper 2-3 pinnatifid, with entire lanceolate segments. Umbels and flowers u.s. Fruit hairy, with adpressed hairs. (A) Native of the Levant. Cultivated since hundreds of years, and sometimes subspontaneous. April-May.-*Apium* Crantz.-*Anisum* vulgare Gaertn.-*Sison* Spreng.-*Tragium* Lk e. Anise or Sweet Cumin. I. Anice, Anacio. M. Hleuua, Anisi.

### CUMINUM L.

Plant more orn less pubescent and glaucous, strongly scented. Stem erect branched from the base (15-30 diameter). Leaves 1-2 pinnatifid, into linear and entire *Laciniae*. Umbels furnished with involucre of capillary bracts. Involucel consisting of a few capillary bracts. Calyx with 5 lanceolate teeth. Fruits elongated, slightly compressed at the sides, with 5 filiform ridges and 4 intermediate ones more prominent and slightly prickly, beneath each of which there is one vitta. Includes only one species.

CUMINUM CYMINUM L. Flowers pink. Fruit hairy or scabrous.

Native of the Levant. Cultivated for centuries, and occasionally subspontaneous in fields where it was grown. May. E. Cumin or Cummin. I. Comino. M. Chemun (Kemmoon).

Cumin has powerful carminative wualities, like Anise, but stronger. However it is not used in Malta as a condiment, but is exclusevely grown for exportation, chiefly to North America, France and Northern Europe. Cianter in his "Malta Illustrata", writing in 1777, states that the annual production of cumin was on an average 3,000 quintali (525,000 lbs), at the same time that the production of Anise seed averaged 1,000 quintali, and that of cotton (seed-cotton) averaged 14,000 quintali. Geoffrey in his "Materia Medica" printed in 1747, concerning cumin states "*Melita insula copiose seritur*", and does not mention any other place of origin; and Quintino, writing in the XVI Century, says "*incolis magnum Cumini atque Cotoni cum exteris nationibus commercium*".

### RIDOLPHIA Moris.

Leaves with capillary segments. Umbels large, with many rays: flowers yellow. Calyx indistinct. Fruit with indistinct ribs. Involucre and involucel wanting. Includes only one species.

RIDOLPHIA SEGETUM Moris. Plant annual, erect, branched, pyramidal, fetid, 2-10 diameter high. Leaves 2-3 pinnatoseptate with capillary segments. Umbels large or very large, many-rayed Fruit oblong, about 2 mm long, with indistinct ribs. (A) April-June. Mediterranean region and the Canaries; naturalised elsewhere. *Malta*, *Gozo*, *Comino*, *Selmun*; frequent and

sometimes common among growing crops, and also in valleys and on uncultivated ground.-*Anethum segetum* L.-*A. pusillum* All.-*Carum ridophia* B. et H. f. *Busbies-il-kamh*.

#### SCANDIX (Tourn.) L.

Leaves much divided. Flowers white in compound umbels, of 1-3 rays, with or without an involucre of short linear bracts. Fruit oblong, with a very long rostrum, compressed laterally and hairy at least along the margin: ridges not winged: one vitta in each vallecule. Carpophore entire or bifid. Species about 14, broadly distributed in the temperate and subtropical regions of the old world, especially in the Mediterranean region.

#### SCANDIX PECTEN-VENERIS L.

Plant glabrous or hairy, unscented. Stem prostrate, ascending or erect, furrowed, and branched (1-4 diameter). Leaves 2-3 pinnatoseptate, with short linear segments. Umbels of 1-3 rays. Involucre wanting. Involucel of 5 bracts longer than the pedicels, entire or pinnatifid. Petals subequal. Fruit  $3\frac{1}{5}$  cm long, with stiff hairs along the marginal ribs only (A) Europe, North Africa, West Asia, naturalised in North America. March-April. Common in *Malta*, especially in the western districts; rather frequent in *Gozo*, and *Comino*. E. Shepherd's needle, Venus's comb. I. *Acicula*, *Spillettoni*. M. *Maxxita*. In the green state it is considered as an excellent fodder for animals.

#### ANTHRISCUS Bernh.

Leaves divided. Flowers white, in compound umbels, provided with involucre. Fruit ovoid or lanceolate, briefly beaked at the apex, glabrous. Mericarps without ridges and without vittae. Carpophore bifid or only toothed at the apex. Species about 13, natives of Europe, temperate and subtropical Asia, North Africa and Abyssinia.

**ANTHRISCUS CEREFOLIUM (L) Hoffm.** Plant aromatic, strongly scented of anise. Stem glabrous, or hairy only at the inferior nodes, erect, branched from the base (3-8 diameter). Leaves glabrous, 3 times triseptate, or pinnatoseptate, with cuneate-ovate segments, toothed and septate. Umbels of 3-6 rays, without involucre. Involucels of ciliated linear-lanceolate bracts. Fruit linear, 7-9 mm long, black, with a rostrum about the length of the seed, smooth or with spiny hairs. (A) Native of Southern Russia, Caucasus, and Asia Minor. March-May. Cultivated as a condiment, and occasionally semi-naturalised in gardens.

#### FOENICULUM (Tourn.) Adans.

Leaves very finely divided into capillary segments. Flowers yellowish or greenish in compound umbels, with involucre and involucel of two or more capillary bracts. Fruit ovate-oblong, glabrous, with prominent equidistant ribs, with 1-2 vittae in each vallecule. Carpophore deeply split in two. Species 3, natives of South Europe, West Asia and the Caucasus, North Africa and the Canary Islands.

## FOENICULUM VULGARE Mill.

Stem erect cylindrical or slightly compressed, striated, branched above (5-20 diameter). Leaves 2-3 pinnatifid with pinnatoseptate segments, dividing into capillary laciniae, glabrous and somewhat glaucous. Leaf-sheath often very large and fleshy. Flowers yellow, without involucre and involucre. (P), (B), (A) May-September. Central and Southern Europe, Western Asia, North Africa.- *Anethum Foeniculum* L.

Var. *a capillaceum* Gilib. Terminal umbels with 20-70 rays, lateral umbels with only 8-10 rays. Upper leaves, with flaccid laciniae (10-60 mm). The perennial form (*a. officinale* All) with a pithy cylindrical stem, and strongly flavoured seeds, often collected for use as condiment, is common on rocky and waste grounds in *Malta*, *Gozo* and *Comino*. E. Fennel. I. Finocchio. M. Busbies, Busbies salvagg. The annual or biennial form. (*b sativum* Bert.) is sometimes cultivated for the sake of its seeds which have a delicate flavour. It has cylindrical, hollow- stems, and lower leaf-sheaths just fleshy. I. Finocchione. M. Busbies taz-zerrigha. Another annual or biennial form (*c. dulce* Mill) having hollow and rather compressed stem, with very fleshy and distichous lower leaf-sheaths, is cultivated as a vegetable. E. Sweet Fennel. I. Finocchio di Bologna o Finocchini. M. Busbies, Busbies tal gidra.

Var. *B. piperitum* Sweet, D.C. Stem pithy, laciniae of the upper leaves rigid (2-6 mm); umbels all with 6-12 rays. Flowers deep yellow, almost orange; seeds strongly flavoured. Also frequent on rocks and exposed waste lands in *Malta* and *Gozo*. I. Finocchio arancino. M. Busbies salvagg.

## KUNDMANNIA SCOP.

Flowers small, yellow, in compound umbels; involucre and involucre present. Calyx with 5 small teeth. Fruit lanceolate, smooth, with equidistant ribs, 2 or more vittae in each vallecula: carpophore split in two. Includes only one species.

KUNDMANNIA SICULA (L) D.C. Plant glabrous, with an erect stem, simple or branched (2-6 diameter). First leaves entire, the others 1-2 pinnatoseptate, with ovate or ovate-lanceolate toothed segments. Umbels of 10-16 rays, involucre and involucre of many reflexed bracts. (P) April-May. Italy, Sicily, Balearic Islands, Crete, North Africa. Frequent in *Malta* and especially in the western districts, and also in *Gozo* and *Comino*, on rocky wastes, along walls of fields etc.-*Sium siculum* L.-*Ligusticum balearicum* L.-*Brignolia pastinacaefolia* Bert.

## CRITHMUM (Tourn.) L.

Flowers whitish or greenish; petals incurved, not emarginate. Calyx without limb. Fruit ovoid-oblong, not compressed, with a spongy pericarp; mericarps with very thin ribs, glabrous: vittae numerous and very thin. Carpophore split in two. Involucre and involucrel present. Includes only one species native of Western and Southern Europe, the shores of the Black Sea and Asia Minor, North Africa and the Canary Islands.

**CRITHMUM MARITIMUM L.** Plant glabrous, and succulent in all its parts, slightly glaucous. Stem erect or ascending, thick, striated, simple or sparsely branched (1-4 diameter). Leaves fleshy, 2-3 pinnatoseptate, with entire, lanceolate segments: the upper leaves triseptate or almost reduced to the leaf-sheaths. Involucre and involucrel of several lanceolate or ovate-lanceolate bracts. (P) June-September. Frequent in the fissures of rocks, walls etc along the sea-shore in *Malta*, *Gozo* and *Comino*, just out of the reach of the waves, or in the immediate neighbourhood, rarely much farther inland. E. Samphire. I. Finocchio marino, Cretamo, Erba S. Pietro, Bacicci. M. Busbies tal Bahar. The leaves are sometimes used pickled like capers.- *Cachrys maritima* Spreng.

#### OENANTHE (Tourn.) L.

Calyx with 5 well developed segments, lanceolate-acuminate. Flowers white or light pink, petals incurved and emarginate. Fruit ovoid, ovoid-globose, oblong, or almost cylindrical, glabrous. Ribs of mericarps not winged, the secondary ribs very thin or wanting: only one vitta in each furrow. Species about 20, chiefly natives of the northern hemisphere.

**OENANTHE GLOBULOSA L.** Plant glabrous, with fibrous club-shaped roots. Stem erect or prostrate, hollow, striated, branched (3-5 diameter). Stem leaves 2 pinnatoseptate, with lanceolate-segments, entire or 2-3 fil. The upper leaves pinnatoseptate with linear and entire segments. Umbels of 2-6 rays, the fertile umbels globose and with thickened rays. Involucre absent, or reduced to a linear bract; involucrel of several linear bracts, a little shorter than the umbel. (P) South Europe and North Africa. March-May. Frequent in *Malta*, as at Ghain Rihana, Ghain Mula, Gneina, Fiddien, Imtahelb, Wied Kirda, along water courses and on the margin of ponds; and also in similar situations in the valley of Ramla (*Gozo*). The plant is reputed very poisonous.

#### KRUBERA Hoffm.

Calyx of 5 minute teeth. Petals expanded, white, with the apex incurved. Fruit oblong-ovate: schizocarps with equidistant and subequal ridges, thick, transversely rugose: vittae wanting; carpophore finally becoming cleft. Includes only one species.

**KRUBERA PEREGRINA (L.) Hoffm.** Plant usually biennial, glabrous. Stem erect, cylindrical and striated below, angular and grooved above, dichotomously branched, sometimes decumbent or prostrate 1-5 diameter high. Leaves tripinnatifid, with pinnatifid segments, with lanceolate or linear lobes, mostly entire. Umbels of 2-5 rays; involucre wanting or reduced to a

few bracts: involucre of 4-6 bracts. (B) or (A) Mediterranean region, Madeira, Canary Islands. April-May. *Malta*, rare, at Ghajn Mula and Ghajn Rihana.-*Tordylium peregrinum* L.-*Conium dichotomum* Desf.-*Capnophyllum dichotomum* Lag.-*C. peregrinum* Lange.

#### FERULA (Tourn.) L.

Leaves large, finally cut in capillary and succulent segments. Flowers yellow, with entire petals in compound umbels, with or without involucre and involucre of capillary broadly sheathed bracts. Fruit oval or oblong, much compressed, with a smooth margin. Mericarps with 3 dorsal ribs hardly prominent, and the 2 lateral thickened and expanded. Carpophore deeply bifid. Species about 50, natives of South Europe, Western and Central Asia, North Africa and Abyssinia.

**FERULA COMMUNIS L.** Stems erect, cylindrical, thick, pithy, striated, branched, (1-2½m.) Leaves with ample sheaths of oval shape, many times divided, with segments entire or 2-3 partite, linear or linear-setaceous, terminating in a point. Fruit 12-18 mm long, with a scaly or pubescent face, with 2-6 vittae in each face. (P) Native of the Mediterranean region and Abyssinia. Frequent in *Malta* and *Gozo* and especially in *Comino*, in valleys and on waste rocky lands, under carob-trees etc. March-May. The dry stems are used as strops for setting razors. E. Ferule. I. Ferola, Ferolaggine, Finocchiaccio. M. Ferla.

**Var. nodiflora L.** Segments of leaf membranous (½-1 cm long), fruit rounded at both ends. Central umbel on a peduncle shorter than the others. With the species at *Comino* and *Boschetto*, and probably elsewhere.

**Var. glauca L.** Segments of leaf rather succulent, and broader than in the type, green on the upper surface, glaucous or whitish on the lower surface. Rare, at *Wied Babu*, *Wied Encita* and *Comino*.

**FERULA NODOSA (L) Jacks.** Stem very much thickened at the nodes, erect, pithy, finely striated, branched (6-22 diameter). Plant glabrous, leaves many times pinnatoseptate, with short entire, linear or acicular segments rigid and mucronate. Umbels with 5-10 rays; involucre and involucre made of several reflexed bracts. (P) Sicily, Greece, Crete. March-June. On the hills around Ghajn il Gbira. *Malta*, according to G. Delicata.-*F. rigida* Ten.-*F. geniculata* Guss.-*Peucedanum n. dosum* L.-*Ferulago geniculata* Guss.-*Ferulago nodosa* Boissier.

This species must be exceedingly rare here, as it was never found again by others.

#### TORDYLIUM (Tourn.) L.

Leaves pinnatoseptate: umbels compound. Calyx with 5 small teeth. Petals patent, with the apex incurved. Fruit scabrous or covered with bristles, oval or roundish, flat, with a thick margin transversely rugose, resulting from the

connivance of 4 lateral ribs. Mericarps having the 3 dorsal ribs hardly distinct, and the 2 lateral thickened and prominent. Vittae 1-3 in each furrow, and 2 or more in each face. Carpophore deeply bifid. Species about 12 natives of Europe, Western and Central Asia, and North Africa.

**TORDYLIUM APULUM L.** Plant pubescent. Stem erect deeply striated, pithy, branched from the base upwards (2-5 diameter). Lower leaves with roundish segments, toothed or cut; upper leaves lanceolate with lanceolate or linear segments. Umbels of 5-8 rays, involucre and involucrel made of linear-filiform bracts, those of the involucrel being shorter than the secondary umbel. Flowers white, the outer flowers having one large petal, equally bifid. Fruit 6-10 mm long, minutely granulose, with a transversely rugose margin. (A) South Europe, Asia Minor, North Africa. February-April. Very common in fields and rocky places in *Malta*, *Gozo* and *Comino*. – t. *concinnum* Ten. E. Hartwort. M. Haxixet it-trierah.

### **CORIANDRUM (Tourn.) L.**

Leaves pinnatifid or bipinnatifid. Umbels with 2-10 rays, without involucre or with one setaceous bract. Flowers white or light pink. Calyx with 5 minute oval or lanceolate teeth. Fruit globose, with 10 very thin ribs, alternately straight and undulant; no vittae in the furrows, but there are 2 vittae in the face. Carpophore entire. Species 2, one of which native of Syria.

**CORIANDRUM SATIVUM L.** Plant glabrous and fetid. Stem erect, striated, branched (2-6 diameter). Leaves 1-2 pinnate, the lower with trifid and the upper with pinnatifid segments, the segments in the uppermost being narrowly linear. Umbels of 3-10 rays. Involucre wanting, or represented by one linear-setaceous bract. Involucrel of 2 or 3 unilateral, very narrow, bracts. Fruit 3-4 mm in diameter. (A) Native of the Eastern Mediterranean region and North Africa. April-May. Cultivated and sometimes subsponaneous along the walls of fields. E. Coriander. I. Coriandolo. M. Cosber.

The fruit or seed has a fetid scent when still green, but on drying develops an aromatic flavour, owing to which it is used as condiment, chiefly in the manufacture of sausages.

### **BIFORA Hoffm.**

Leaves 2-pinnate. Umbels of 4-7 rays. Flowers white, petals patent, with the apex incurved and emarginate. Calyx without apparent limb or teeth. Fruit biglobose, mericarps globose, and therefore with a linear face, ribs hardly distinct except in the dry plant. Vittae wanting. Carpophore bipartite. Species 4, 2 of which natives of Central Europe and the Mediterranean region, 1 of North America and 1 of Cochinchina.

**BIFORA TESTICULATA (L) D.C.** Plant glabrous and fetid. Stem erect, angular and striated, branched, (2-5 diameter). Leaves 1-2 pinnate, the lower with cuneate-oval segments, pinnatifid; the upper with segments deeply cut into linear laciniae. Umbels of 2-3 rays. Flowers with subequal petals. Fruit



very rugose, with face 5-7 times as long as the styles, hollowed at the base, and slightly mucronae at the top. Involucre wanting or consisting of one linear bract. Involucel of one or two linear bracts (A) South Europe, North Africa, Asia Minor. March-May. In fields at San Martin, Wardia, Pualet, Gneina, Wied Gherzuma, Zebbieh, Wied Balluta, Sliema. Frequent but not common.-*coriandrum testiculatum* L.-*Bifora flosculosa* M.B. I. *Coriandolo selvatico*. M. Bumneier, Cosbor salvagg.

**BIFORA RADIANS** M.B. Plant u.s. Stem erect, branched, angular and furrowed (2-5 diameter). Umbels of 4-7 rays. Flowers with outer petals larger than the others. Involucre and involucel u.s. Leaves u.s. Fruit minutely granulose, with a face only 1½ to 2 times as long as the styles, hollowed at the base and top. (A) Central and Southern Europe, Asia Minor and the Caucasus. March-May. Found by Gulia; locality not stated and not found afterwards by others.

### DAUCUS (Tourn.) L.

Leaves much dissected. Calyx with 5 teeth hardly visible. Flowers patent, petals incurved and emarginate. Fruit ovoid or oval oblong. Mericarps with primary ribs having hairs or bristles, and with the secondary ribs furnished with 1-3 rows of hooked bristles, sometimes minute and tooth-like. Carpophore split in two. Involucre of many pinnatifid involucral bracts. Species about 20, natives chiefly of Europe, North Africa, Western and Central Asia.

**DAUCUS CAROTA** L. Plant may be glabrous or scabrous or hirsute. Stem erect or ascending, striated, branched, sometimes rising up to about 2 m. Lower leaves with segments toothed or cut into almost capillary lobes. The other leaves 2-3 pinnate, the upper sometimes 1 pinnate. Umbels of many rays. Fruit 2-4mm in diameter, with the two lateral ribs of one mericarp not connivent with those of the other mericarp (A) (B). Broadly distributed in Europe, Asia and Africa. Naturalised in North America, South Africa and Australia. April-May. The typical form is common in fields and on waste ground in *Malta* and *Gozo*. The form *bisativus* D.C. with a very thickened taproot, is very commonly cultivated as a vegetable. E. Carrot. I. *Carota*, *Carota selvatica*, *Gallinacci*. M. *Zunnaria*, *Zunnaria salvagga*, *Carrotti*.

Var. *rupester* Guss. Peduncle of the umbels in fruit club-shaped or much thickened at the insertion of the rays. Segments of leaves rather succulent, with the upper surface lucid green. Involucel of linear bracts, scarious along the margin. On rocks and precipitous cliffs close to the sea *Malta*, *Gozo*, *Comino* and *Cominotto*, but not common anywhere. March-May.-*Daucus lucidus* Z.

Var. *lopadosanus* Ten. Umbels in fruit with rays very much thickened; peduncle of the umbels hardly thickened at the insertion of the rays. Involucre about half the length of the umbel or almost equal. Hooked bristles or thorns of the fruit about twice its length. March-May. Frequent at *Ahrax*; less

frequent at St Paul's Bay, Melleha and Selmun in *Malta*, and in *Comino*, on rocks near the sea-shore.

Var. *Gingidium* L.-*Daucus gummifer* Brenner. (non Lam). Peduncle of umbels hardly thickened at the insertion of the rays. Stem glabrous or scabrous or even hirsute, as in the type. Involucre of ovate-lanceolate or lanceolate bracts, very scabrous. Leaves with segments lucid on the upper surface and rather succulent. Hooked thorns of fruit shorter than the diameter of same. April-May. Frequent in rocky places along the sea-shore in *Malta*, *Gozo*, *Comino* and *Filfol*.

**DAUCUS BICOLOR** S. et S. Plant hirsute. Stem erect or ascending, striated, alternately branched (2-4 diameter). Leaves 2-pinnate. Involucre as long as the umbel of longer: involucre of entire lineal bracts, ciliated along the margin. Petals white, the external being larger, and the internal sometimes pink. Fruit 3 mm long, with thorns not confluent at the base. (A) Italy, Greece, Syria, Asia Minor.-*D. setulosus* Guss.-*D. scabrosus* Bert.-*D. speciosus* Ces. Given as native of *Malta*, by Caruel, but not found again by anybody else.

**DAUCUS PUMILUS** Ball. Plant annual, densely tomentose and whitish, with prostrate stem, simple or branched from the base, 5-20 cm long. Leaves 2-3 pinnatoseptate, the last segments being shorter and oblong. Involucre and involucre with 2-6 bracts. Calyx with triangular teeth. Petals white or rosy. Fruit 6-8 mm long, hairy, with thorns having a broad base. Style short (A) Mediterranean region. March-May. In sandy places along the sea-shore. *Malta*, frequent at Melleha and Ahrax, less frequent at Ghajn tuffieha, Gneina, Bahar-ic-Ciaghak and Marsascala. *Gozo*, rather rare, at Ramla and Kbajjar. *Comino*, also rare, at Kala Santa Maria.-*Caucalis pumila* L.-*D. muricatus* b. *maritimus* L.-*D. maritimus* Gaertn. Non Lam.-*caucalis maritima* Gouan.-*Orlaya maritima* Koch. I. *Lappola marina*.

#### TORILIS ADANS.

Leaves bipinnate. Flowers small, white or pink, in small umbels, with involucre and involucre reduced to linear bracts or wanting. Calyx with 5 minute teeth. Fruit ovate or oblong: mericarps with 5 primary ribs of which the dorsal have shorter thorns than the laterals: 4 secondary ribs with 2 or more series of thorns. Thorns scabrous, often hooked, sometimes reduced to tubercles. One vitta under each secondary rib. Carpophore bifid or bipartite. Species about 20, inhabiting Europe, Western and Central Asia as far as Japan, North Africa, the hilly districts of tropical Africa, and the Canary Islands.

**TORILIS ARVENSIS** (Huds.) Lk. Plant erect or more commonly prostrate, with adpressed hairs. Stem striated, almost dichotomous (3-8 diameter). Leaves bipinnate, with lanceolate laciniae. Umbels with a long peduncle, having 2-8 rays. Fruit 3-4 mm long, with secondary ribs having more than 2 series of thorns, which are hooked at the end. (A) Central and Southern Europe, Western Asia, North Africa etc. The typical form has not been

collected yet.-*Caucalis arvensis* Huds.-*Scandix infesta* L.-*Caucalis helvetica* Jacq.

Var. *purpurea* Guss. Outer flowers with petals of the same length as the others: upper leaves undivided or reduced to 3 segments, entire or serrated. (A) April-May. *Malta*, rare, Wied Ghomor, Gharghar, Mistra, Gneina, in fields and along footpaths and in neglected corners.-*Caucalis purpurea* var. *heterophylla* Caruel.

**TORILIS NODOSA** (L) Gaertn. Plant u.s. Stem u.s. little branched (1-3 diameter). Leaves pinnate with pinnatopartite segments, lanceolate or linear, entire or cut. Umbels subglobose, with 2-3 short rays, opposed to the leaves, sessile or almost sessile, occasionally with a long peduncle in vigorous plants (form: *pedunculris* Ten.) Involucre and involucrel of several linear setaceous bracts. Flowers white, petals all equal. Fruit 2½mm long; with stiff straight thorns, or thorns wholly or partly reduced to tubercles. (A) Central and Southern Europe, Caucasus, Western Asia, North Africa, and naturalised in America. March-May. Common in *Malta* and *Gozo*, on land both cultivated and uncultivated. Attard Wied Encita, Boschetto, Gneina, Fiddien, Imtahleb, Wardia, etc.-*Tordylium nodosum* L.-*Caucalis nodosa* Scop.-*C. nodiflora* Lam. I. Lappolina.

## ORD. ERICINAE.

### ERICACEAE.

Perennial plants small shrubs erect or prostrate, sometimes small trees; with simple leaves, entire or toothed, often acicular or needle-shaped, usually smooth and more or less coriaceous alternate, opposed or whorled, without stipules. Flowers often drooping generally in small clusters or racemes and sometimes solitary in the axils of the leaves, or produced in terminal leafy racemes or even in terminal clusters or heads. Calyx of 4 or 5 lobes, very rarely free sepals, with the tube adhering to the ovary or free. Corolla superior or inferior, usually ovoid, globular urceolate or campanulate, with limb terminating in 4-5 lobes, rarely with 4-5 almost separate petals. Stamens twice as many as there are lobes of the corolla, rarely only as many as them, inserted within the corolla but not adhering to it. Anthers with apical poricidal dehiscence, rarely with transverse valves. Ovary with as many loculi as there are segments in the corolla. Fruit a capsule, sometimes a berry, with one or more small albuminose seeds in each cell. This is a considerable family which includes 87 genera and about 1330 species distributed all over the world, in cold or temperate or mountainous regions, except in Australia.

Most Ericaceae are rich in tannic acid; others (*Arbutus*, *Vaccinium*) produce edible berries; a few are used in medicine. The roostock of *Erica arborea* a

native of Southern Europe is used for the manufacture of the so-called Briar Pipes. Many species of *Rhododendron* and *Azalea* are highly ornamental flowering plants. The flowers of certain species of *Rhododendron*, *Kalmia*, *Azalea*, etc. contain a more or less poisonous nectar.

## 1. ERICA. 2. PENTAPERIA

### ERICA (Tourn.) L.

Small evergreen shrubs, sometimes reaching a height of 2 or 3 metres, with small alternate or whorled rigid needle-like leaves, with margins reflexed downwards. Flowers usually pendulous axillary or produced in terminal, short, leafy racemes. Calyx not exceeding half the length of the corolla, with 4 greenish segments, sometimes associated with 2-3 minute bracts. Corolla persistent, glabrous, globose or ovoid, gamopetalous, with a limb terminating in 4 teeth or lobes. Stamens 8, hypogynous. Anthers with apical dehiscence, through two pores or slits. Ovary 4-locular, with many ovules; style 1, stigma 1. Fruit 4-locular capsule, with many seeds, and loculicidal dehiscence. Species 400 mostly natives of South Africa, a few inhabiting Europe, the Mediterranean region and the Azores.

*ERICA MULTIFLORA* L. Evergreen shrub, erect or ascending, very much branched, glabrous (3-10 diameter). Leaves whorled by 3-5, linear, obtuse, entire, furrowed on the under surface, 6-13 mm long. Flowers flesh-coloured, sometimes pink or very rarely almost pure white (form *albiflora* mihi) 1-3 together in the axils of the leaves forming terminal leafy racemes, sometimes prolonged in a leafy shoot without flowers. Corolla 4-4½mm long. Anthers dorsifix, and protruding outside the corolla. (S) Native of the western Mediterranean region and Greece. December-March. Frequent on rocky hills and wastes, and especially along the rocky sides of valleys in *Malta*, as at Wardia, Wied il Ghasel, Wied Encita, Wied Kerda, Boschetto, Ta Laurenti, ghirghenti, tal ghalia, Wied Babu, Ta Baldu, Dingli, Ahrax etc. Less frequent in Gozo, Imgiar-ix-Xini, Xlendi, Ta Cenc, Nadur etc. e. Mediterranean Heath. I. *Scopa florida*. M. *Savina*. Issopu, Lehjet ix-Xieh.-*Erica peduncularis* J. et C. Presl. Non Salisb.-*E. vagans* Desf. Non L.-*Gysocallis multiflora* D. Don.

*ERICA CARNEA* L. A small bushy, prostrate, straggling evergreen shrub, glabrous (2-5 diameter). Leaves whorled by 3-5, linear, acute, entire, rigid, keeled on the upper surface. Flowers flesh-coloured, 1-3 in the axils of the leaves, forming leafy unilateral racemes along the branches, with short pedicels having 3 minute bracts about their middle. Corolla 4-5½mm long. Anthers basifix, and protruding slightly from the corolla. (S) France, Italy, Switzerland, Germany, Austria. January-April.-*Erica herbacea* L.-*E. saxatilis* Salisb.-*Gysocallis carnea* D. Don. I Scopina. Wied Gherzuma (Gulia).

### PENTAPERIA Klotzsch.

Calyx the length of the corolla, with 4 or more often 5 flesh-coloured segments, without bracts. Corolla ovoid, externally pubescent, generally with

5 lobes, with 8, or more often with 10 stamens. Ovary and capsule with 5 loculi, sometimes with 4 loculi. Only one species.

PENTAPERIA SICULA (Guss) Klotzsch. A small erect evergreen shrub, having the young twigs ash-coloured and pubescent, (2-10 diameter). Leaves in whorls of 4, linear, obtuse, succulent, at first pubescent and afterwards glabrous, 6-9 mm long. Flowers solitary, or 2-4 together in terminal umbels. Pedicels with 1 bract below and 2 about the middle. Anthers dorsiflex, and included within the corolla which is flesh-coloured or white, 8-9 mm long. (S) Sicily, Cyprus, Libya. March-May.-*Erica sicula* Guss. Found in *Malta* according to Gulia; never found again by other collectors.

## ORD. PRIMULINAE.

### PRIMULACEAE.

Herbaceous plants rarely suffrutescent. Leaves radical or alternate or opposed or whorled, simple, mostly entire, rarely pinnate, without stipules. Flowers may be axillary, or in terminal racemes or umbels. Calyx gamosepalous, with 5 teeth, sometimes with 4-7 teeth or segments. Corolla gamopetalous with as many teeth or segments as the calyx, sometimes wanting. Stamens as many as the segments of the corolla and opposite to them, inserted on the tube, or where the corolla is wanting inserted on the tube of the calyx and alternate with its segments. Ovary unilocular. Style simple, stigma capitate. Fruit unilocular capsule, with several seeds, with a central and free placenta often thick and globose.

Includes 28 genera and about 350 species inhabiting chiefly the temperate regions of the northern hemisphere.

#### 1. ANAGALLIS. 2. SAMOLUS.

##### ANAGALLIS (Tourn.) L.

Annual or perennial herbs, procumbent or ascending, with simple opposite entire leaves, and small solitary opposite flowers on long pedicels in the axils of the leaves. Calyx of 5 segments. Corolla rotate or funnel-shaped, with a very short tube and 5 lacinae. Stamens 5 inserted at the base of the corolla, with hairy and glandular filaments. Style filiform; stigma capitate. The fruit is a globular unilocular capsule, with a transverse dehiscence (pyxidium). Seeds small, numerous, rugose. Species 10, native of Europe, Western Asia, North and South Africa, North and South America.

ANAGALLIS ARVENSIS L. An annual plant, glabrous, with a slender stem, quadrangular, prostrate or ascending, sometimes rooting at the nodes (1-3 diameter). Leaves sessile, more or less ovate or ovate-lanceolate, opposed

or whorled, with rusty dots on the lower surface. Segments of calyx lanceolate, acuminate, keeled and toothed on the outside. Corolla with roundish lanciniae. Pedicels slender, capsule drooping. (A) Cosmopolitan, in various varieties and forms.

Var. a. *phoenicea* Scop., All. Plant well developed. Leaves ovate, or ovate lanceolate. The lower opposed, the upper whorled. Corolla longer than the calyx, bright red, with a purplish throat, with lobes entire at the apex, and ciliated at the margins. Peduncles longer than the leaves, rarely equal. Common in fields, gardens and uncultivated lands, in *Malta*, *Gozo* and *Comino*. February-July. E. Red Pimpernel or Common Pimpernel. I. Anagallide or Bellichina. M. Harira hamra. A form with pale red or whitish flowers is sometimes met with.

Var. b. *caerulea* Schreb. Plant, u.s. or stronger. Leaves ovate or ovate-lanceolate, the upper ones often whorled in 3 or more, and then they are oblong-lanceolate (form: *verticillata* All.) Peduncles shorter than the leaves, sometimes subequal, rarely longer. Corolla blue, with a violet-red throat; with lobes toothed at the apex, and entire or hardly ciliated along the margins. February-July. E. Blue Pimpernel. I. Anagallide. M. Harira cahla. Common as above; perhaps more frequent in gardens and shaded localities.

#### SAMOLUS (Tourn.) L.

Small herbs with alternate entire leaves, and small flowers in terminal racemes, simple or branched. Calyx campanulate, with the tube adhering to the ovary, and the limb with 5 segments. Corolla funnel-shaped with a short tube and 5 segments, and with 5 scale-like teeth on the throat. Stamens 5, inserted on the tube of the corolla. Style 1; stigma 1, capitate, depressed. Fruit a capsule, dehiscent by means of 5 teeth at the apex. Seeds minute, angular. Species 8 distributed in Australia, South Africa, North America, and one-the native species, -cosmopolitan.

SAMOLUS VALERANDI L. Plant glabrous; lower leaves rosette shaped, obovate-spathulate, obtuse, entire, provided with a petiole. Stem erect, simple or branched ( $\frac{1}{5}$  diameter), with alternate leaves smaller than the radical. Raceme loose, without leaves or bracts; peduncles rather long, furnished with a minute bract midway. Segments of calyx ovate-acute; corolla white with obovate lobes. (P) Cosmopolitan. April-September. Along water courses, ponds, and wherever there is some dripping of water, in *Malta*, *Gozo*, and *Comino*. E. Brook-weed, Water Pimpernel.

### PLUMBAGINACEAE.

Herbs, small shrubs, often with stiff shoots or trailing. Leaves simple, alternate, more commonly radical forming a rosette, without stipules. Flowers grouped in terminal heads, simple or compound spikes and panicles. Flowers hermaphrodite, actinomorphic. Calyx gamosepalous deeply divided into 5 lobes, almost distinct petals. Stamens 5, hypogynous, inserted at the base of

the corolla or alternate with the petals. Ovary unilocular, with only one suspended ovule. Fruit a capsule, indehiscent, or irregularly dehiscent, containing only one seed. Style deeply 5-fid. Genera 8, comprising about 250 species, broadly distributed all over the world.

## 1. PLUMBAGO. 2. STATICE.

### PLUMBAGO (Tourn.) L.

Perennial plants or at least with perennial rootstock; flowers in spikes, with a tubular 5-toothed calyx, furnished with pedunculate glands along the keels. Corolla hypocrateriform with 5 lobes. Ovary with one loculus and one ovule; 1 style terminating in 5 filiform stigmas. Fruit a utricle, dehiscent transversely at the base, and also longitudinally into five valves which remain coherent at the apex. Species 10, natives of Europe, Africa, tropical Asia, America and Australia.

PLUMBAGO EUROPAEA L. Plant glabrous; stem erect, stiff, angular, branched (5-10 diameter). Lower leaves obovate, and petiolate; the cauline ovate-lanceolate, sessile, with two amplexicaul roundish wings; the upper linear and often toothed. Flower in terminal, short, dense spikes, with a dill violet corolla having obovate lobes. Each flower is furnished with 3 glandular bracts. (P) Mediterranean region. June-November. *Malta*. Frequent in filds, wastes and country-roads in the ditrict between Curmi, Luca and Krendi, rare elsewhere.

### STATICE L.

Flowers solitary or in spikelets of 2 or 3, borne usually unilaterally on spikes, and these forming panicles, usually dichotomous. Calyx gamosepalous funnel-shaped, folded longitudinally, with a scarious limb, and the 5 keels prolonged as teeth or short awns. Corolla hypogynous, of 5 lobes almost free or forming a tube at the base. Ovary 1-locular and 1-ovular, with 5 glabrous styles. Species about 120, distributed all over the world, chiefly in the eastern hemisphere, along the coasts and in saline wastes.

STATICE PSILOCLADA Boiss. Perennial glaucous plant, with radical rosette-shaped leaves, which are entire, obovate-lanceolate, obtuse or emarginate, with a more or less narrow cartilaginous margin. Stems not winged and all more or less flowering branched from the base forming a panicle. Internal bract 3-5 times as long as the outer ones. Calyx with a white scarious limb, and tube hairy along the keels, teeth not produced into awns. Petals violet, almot free except for a ring at the base. (P) Italy, Spain, Greece, Sicily, Algeria. E. Daisy-leaved Sea-Lavender.

Var. *gracilis* Boiss. Plant small (5-25 cm) with roundish spathulate leaves, with thick cartilaginous margin. Spikelets of 2-4 flowers. May-November. Fomm ir-Rieh (according to Delicata)-*Statice bellidi-folia* Guss. Non Gouan.-*St. Sibthorpiana* Steud. non Guss.

STALICE MINUTA L. Perennial plant with a woody rhizome; leaves radical, rosette-shaped, obovate-spathulate, entire without a cartilaginous margin. Flower stems not winged, branched from the base, stiff with ramifications easily broken. Spikes unilateral; spikelets of 1-4 flowers; the spikelets being at some distance apart on rather long spikes. Bracts shaded of a rusty colour with white-scarious margin, the lower bract being herbaceous at the back, the upper narrowly scarious. Calyx and corolla u.s. (P) Mediterranean region.

The typical form has not been collected in the Maltese Islands.

Var. *virgata* w.-St. *cordata* Desf. Non L.-St *oleaefolia* S. et S.-St *Smithi* Ten. Leaves linear-spathulate, acute. Spikelets large but dense, much curved with 2-5 flowers; many lower sterile branches; the fertile stems with erect spikes rather short and having the spikelets rather close together. Very common on cliffs and wastes close to the sea-shore in *Malta*, *Gozo*, *Comino* and *Cominotto*, *Selmun*. May-November. E. Pigmy Sea Lavender. M. Lejjet ix-xieh.

Var. *reticulata* Rehb. Flowering stems reticulated and entwined together, with the spikes spreading at right angles from the stem. The rest u.s. Common in the same localities as the preceding, and as frequent. May-October.

Var. *dubia* Andr. Ex Guss. Stems scabrous, with short internodes hardly thickened, branches of spikes erect, forming a paniced inflorescence. Spikelets small, almost erect, 1-2 flowered. April-October. Sliema, Gzira, etc., according to Delicata.

Var. *cosyrensis* Guss. Plant as in var. *virgata*, with several sterile stems, branches erect but not rigid. Stems smooth: leaves spathulate, obtuse. Spikelets small, almost erect, 1-3 flowered. The upper bract thrice as long as the lower; calyx about 5 mm., with a limb shorter than the tube. Inflorescence rather dense, with short spikes. The flowering stems sometimes with a few spikelets at the top (form: *tenuicula* Tin. Ex Guss). Near the sea-shore on the south-west of *Malta*, Hal Far. May-October.-St *cordata* Guss. Non L.

STATICE LIMONIUM L., the common Sea-Lavender, a native of the Mediterranean region, is frequently cultivated in gardens for its everlasting flowers, and is occasionally met with naturalised on the Valletta and Floriana Glacis, as well as along country-roads and in old gardens.

## ORD. CONTORTAE.

### OLEACEAE.

Trees, shrubs, or woody climbers. Leaves generally opposite, rarely alternate, entire or pinnate. Flowers generally in terminal panicles or clusters. Stipules wanting. Flowers hermaphrodite, very rarely polygamous, actinomorphic. Calyx gamosepalous, of 4 segments, very rarely of 5



segments or wanting. Corolla gamopetalous of 4 segments very rarely of 5 segments or wanting. Stamens 2. Ovary 2-celled, with 1-2 styles. Fruit, a drupe, or a berry, or a capsule or samara. Includes 21 genera and about 380 species, natives of tropical and temperate regions, chiefly of Eastern Asia.

To this family belongs the Olive-tree, the emblem of peace so well known and extensively cultivated for the production of olive-oil and pickled olives. The Ash-tree furnishes a valuable timber of great toughness and elasticity, and the Manna-Ash tree is the source of manna. Other species like the Jasmine and the Lilac are cultivated for ornament and for perfumery.

#### OLEA (Tourn.) L.

Trees or shrubs. Inflorescence in axillary racemes. Calyx persistent, with 4 small teeth. Corolla funnel-shaped, with a short tube and 4 segments, valvate in the bud. Stamens 2, inserted at the lower end of the tube. Ovary 2-locular, with 2 ovules in each loculus. Style short, with 2 stigmas. Fruit a fleshy oleagineous drupe, usually dark purple, with a stony nutlet, having 1, rarely 2 seeds. Species about 31, mostly natives of South Africa, East Indies, Australia and Polynesia.

OLEA EUROPAEA L. An evergreen tree or shrub. Leaves opposite, lanceolate, entire, coriaceous, with a short petiole, and reflexed margin, deep or glaucous green on the upper surface, silvery on the lower surface owing to the presence of squamiform or stellate hairs. Flowers usually in simple racemes, white, on a short peduncle. (S) Native of Western Asia, Nubia and Abyssinia, naturalised in countries bordering the Mediterranean, and extensively cultivated. E. Olive-tree. I. Olivo M. Zebbug.

Var. Oleaster Hoffm. Et Lk. Leaves shorter, oblong, oval or even ovate in young trees or seedlings (form *buxifolia* Ait.) Stems or branches often more or less thorny. Drupes small, elliptical, reddish black. March-May. Frequent in valleys and rocky places in *Malta*, and *Gozo*, Wied Babu, Wied Zurriek, Wied Encita, Bahria, ghain Rihana, Wied il Ghasel etc. gigantic trees of this variety exist in San Antonio Gardens. The form: *buxifolia* is found in Wied Encita, Bahria, Ghain Rihana, Wied il Ghasel etc. Gigantic trees of this variety exist in San Antonio Gardens. The form: *buxifolia* is found in Wied Encita, Boschetto and Wardia. Another form, with deep green foliage, smaller and more roundish drupes, deep reddish black, with a very small stone and very only, is sometimes cultivated (form: *microcarpa* mihi).

Var. *sativa* Hoffm. Et Lk. Leaves long, always more or less lanceolate, except in branches springing from old wood, when they may be oval or oblong. Branches always thornless. Drupe larger, ovoid, elliptical, or sometimes roundish, reddish or purplish black. March-May. Cultivated in many forms or subvarieties. A form of medium height with foliage dark shining green on the upper surface, and an abundant bearer of smallish elliptical umbilicated purplish black drupes (form: *melitensis* mihi.) is known by the name of Maltese olive (M Zebbug Malti).

The wood of the Olive-tree is excellent as firewood, and also valued by the cabinet-maker, especially the richly veined portion at the base of the trunk.

The gigantic Ash-trees, (*Fraxinus excelsior* L.) which exist in the Boschetto valley, and formerly also existed in Wied Kirda near Zebbug were planted, and are not native. They have a venerable appearance and must be over 400 years old, but self-sown plants have not been found either in the Boschetto or elsewhere prior to 1924, when suddenly they became numerous. The young trees existing in the Boschetto Valley were planted a few years ago, and the sudden appearance of fertile seed on the old trees may be due to cross pollination.

*LUGUSTRUM JAPONICUM* Thumb.-L. *Kellerianum* Vis., an evergreen tree native of Japan, China etc., cultivated for ornament in gardens and public avenues, is often met with self-sown.

*JASMINUM OFFICINALE* L., mentioned by Tanfani and Fiori as native of *Malta*, is only cultivated as other species of *Jasminum*, and indeed hardly ever reproduces itself by seed. It was formerly much planted in old-fashioned gardens for the sake of its highly perfumed flowers.

## GENTIANACEAE.

Annual or perennial plants, usually glabrous and herbaceous, rarely woody, with a watery juice. Leaves exstipulate, usually opposite, sometimes whorled, rarely alternate, generally simple and entire. Flowers generally actinomorphic, hermaphrodite, in various inflorescences, terminal or axillary. Calyx usually of 5 sepals, sometimes 4, rarely 6-8 distinct or partly coherent. Corolla gamopetalous, hypogynous, funnel-shaped, hypocrateri-form or almost rotate with twisted or folded aestivation, limb 5-8 fid. Stamens inserted on the corolla, as many as, and alternate with the lobes. Ovary of 2 carpels forming one cell or two incomplete cells. Style terminal, sometimes short or wanting, stigma bifid. Capsule 2-valved, many-seeded. Seeds minute with a fleshy albumen.

This family included 64 genera, and about 750 species distributed all over the world, except in coldest regions.

The Gentianaceae owe their medicinal qualities to a bitter principle called gentianin, and several species are noted tonics and febrifuges, free from tannic and gallic acid and devoid of astrigency. The root of *Gentiana lutea* a native of Central Europe is an officinal bitter tonic. The root of *G. cruciata* is a tonic febrifuge and vermifuge. The native species of *Erythraea*, particularly *E. Centaurium*, are valuable tonics and particularly *E. Centaurium*, are valuable tonics and febrifuges often used against undulant fever. *Chlora perfoliata* another native species, has the same qualities to a lesser degree. *Menyanthes trifoliata*, the water-trefoil, common in Northern and Central Europe is tonic, febrifuge and antisorbutic. Another important bitter tonic and

febrifuge, devoid of astringency, much used in India its native country is *Ophelia Chirita*, the Chiretta plant.

#### CHLORA (Ren.) Adans.

Herbs annual, glabrous and glaucous, with an erect cylindrical stem, usually simple or ramified above. Leaves sessile, entire, opposed or connate. Flowers yellow, in a corymb-like terminal inflorescence. Calyx with 6-12 acute segments, almost triangular. Corolla rotate, with a short tube, and 6-8 oblong lobes. Stamens 6-8, subsessile, inserted on the throat. Style filiform and bifid. Capsule unilateral. Includes only 2 species, natives of Europe, North Africa and West Asia.

**CHLORA PERFOLIATA L.** An annual plant, intensely glaucous, with an erect cylindrical stem, simple or branched at the top. Leaves oval-triangular all perfoliate or connate except the first or radical leaves, and usually shorter than the internodes. Flowers deep yellow, on short pedicels. Calyx with 8 linear or awn-shaped segments; corolla with 8 obtuse lobes. Stamens 8. Capsule obtuse. (A) Central and South Europe, North Africa, West Asia. March-May. In valleys and on uncultivated land in cool localities: frequent in *Malta*, *Gozo*, *Comino* and *Cominotto*. - *Gentiana perfoliata* L. E. Yellow Centaury, Yellow wort.

**Var. serotina Koch.** Cauline leaves oval or oval-lanceolate, with rounded base and incompletely connate. Flowers of a paler yellow: segments of calyx deeply cut down to the base of the calyx-tube, with rounded angles between them (form: *intermedia* Ten). With the type in drier and more exposed situations.

#### ERYTHRAEA (Ren) Neck. Em.

Annual herbs, with an erect usually quadrangular stem, more or less branched at the top. Lower leaves usually rosulate, cauline leaves opposed. Flowers in terminal corymbs or in spikes. Calyx tubulose, with 5 linear segments. Corolla funnel-shaped, with 5 segments. Stamens 5, anthers becoming twisted in a spiral after flowering. Style filiform: stigma bilobed. Capsule linear, with 2 false cells. Species about 25 distributed all over the world.

**ERYTHRAEA SPICATA (L) Pers.** Stem erect, rigid, quadrangular, branched (15-30 cm). Branches erect and fastigiate. Leaves opposed, oval-oblong, rounded at the base, subacute, glaucous. Flowers flesh-white or light pink, almost sessile, in loose spikelets along the branches. Segments of calyx equal to the corolla. Lobes of corolla lanceolate. Style bifid at the apex, with roundish stigmas. (A) South Europe, West Asia, North Africa, naturalised in North America and Formosa. May-August. In open spaces, and especially on clayey soils not far from the sea. *Malta*, more or less frequent at Saline, St Paul's Bay, Melleha, Pembroke Camp, Marsa, Boschetto and Ghain il Cbira. *Gozo*, at Wied il Lunziata, Wied Ramla and near Chambray (Migiarro) – *Gentiana spicata* L.

ERYTHRAEA CENTAURIUM (L) Pers. Plant annual, sometimes biennial, with an erect, rigid, quadrangular stem, much branched at the top, and often branched at the base, (15-35 cm). Lower leaves, rosulate, obovate, obtuse; the upper or cauline oval or linear-lanceolate, acute. Flowers lively pink, sometimes light pink, with long pedicels, in dichotomous cymes, grouped together in a dense corymb. Flowers 10-15 mm long. (A) or (B) Europe, North Africa, West Asia; naturalised in North America. In exposed and dry situations, in valleys and on uncultivated ground. April-June. *Malta*, rather frequent at Wied Encita, Ghain il Gbira, ghirghenti, Saline, Maghtab, Balluta, Wardia, San Martin, Imtahleb, abundant in Verdala Park and at "Ta Rapa" Boschetto. *Gozo*, at Wied Bengemma, Ta Cenc, Imgiar ix-Xini, Wied ir-Rihan, Wied Korrot. *Comino*, common on rocky ground along the road from Cala Sta. Maria to Hospital-Gentiana Centaurium L. E. Common centaury. I. Centaurea minore, Caccia-febbre. M. Centauria.

Most of the local plants belong to the variety grandiflora Biv., with stem much branched above, and larger flowers, up to 30 mm long. The variety compacta Moris, with smaller flowers, grouped together in dense heads or cymes, usually with simple stem only slightly ramified above, is met with in the more arid localities.

ERYTHRAEA PULCHELLA (Sw.) Horn. Plant annual, with an erect, rigid, quadrangular stem, usually simple and rather short, much branched at the top, (2-15 cm). Flowers a lively pink, often light pink or flesh-coloured, rarely white, forming a loose corymb, proportionately larger and more open than in the preceding species; in arid localities the flowers are few, forming a small head on plants hardly more than 5 cm high. Lower leaves rosulate, cauline leaves ovate or ovate-oblong. Lobes of corolla oblong-triangular. (A) Europe, North Africa. Abyssinia, West Asia as far as China, Madeira, Canaries; naturalised in North America. April-July Common in *Malta*, *Gozo*, *Comino* and *Cominotto*.-Gentiana pulchella Sw.-Erythraea Carueliana A. Terr.

Var. tenuiflora Hog. Et Lk Corolla with filiform tube (less than 1 mm in thickness). Stem usually more branched above, with more spreading branches. With the typical form, but less frequent. The form: ramosissima Pers.-Gentiana ramosissima Vill, is frequent in the Boschetto and at Wied Encita; it is very branched from the base, and usually with small light-pink flowers.

## APOCYNACEAE.

Perennial herbs, shrubs and trees, often climbing, with a milky or yellowish juice. Leaves opposite or whorled, rarely alternate, simple, entire and exstipulate. Flowers actinomorphic, hermaphrodite, terminal or axillary, generally in a corymb-like cyme. Calyx with 5 segments, rarely reduced to 4. Corolla hypogynous, gamopetalous, deciduous, funnel-shaped or hypocrateriform; with a limb parted in 5 or 4 lobes, twisted in the bud, rarely valvate. Stamens inserted on the corolla, anthers usually acuminate or mucronate or

sagittate, sometimes partly coherent, with granular pollen applied directly to the stigma. Carpels 2 distinct or cohering in 2 or more-celled ovary, with numerous ovules: style simple, stigma generally bifid. Fruit various. Seeds usually compressed, often plumose or furnished with pappus.

The family includes 132 genera and about 1,000 species, distributed in the tropical and temperate regions of the world.

A few species are bitter and are employed as purgatives febrifuges or depuratives such as *Allamanda cathartica* and *Carissa xylopicron*. The wood of *Alstonia scholaris* is a powerful bitter tonic. Others are very poisonous such as *Cerbera Ahouai*, *C. Thevetia*, *Tanghinia veneniflua*, *Nerium Oleander* etc. Other species furnish a milky juice used for food, such as *Carissa edulis*, *C. Carandas*, *Tabernaemontana utilis*. *Carpodinus dulcis* etc. Several species yield india-rubber, such as species of *Landolphia* and *Cryptostigma* of Western Africa, *Hancornia* of Brazil, *Willughbeia* of India etc. The seed of *Tanghinia veneniflua* of Madagascar is extremely poisonous, one seed as large as an almond being said to be sufficient to kill twenty persons. All parts of the common *Oleander* are poisonous, and cases of fatal poisoning have happened by stirring and mixing food in a pot by means of a stick of oleander-wood.

#### NERIUM L.

Trees or tree-like shrubs with persistent opposed or whorled lanceolate leaves. Flowers terminal, in corymbose cymes. Calyx 5-cleft, with lanceolate segments. Corolla hypocrateriform, with 5 lobes, oblique, contorted in the bud, with 5 laciniate ligules on the throat. Stamens 5, with anthers adherent to the stigma, each with 2 caudicles at the base, and a plumose appendix at the apex twisted spirally with that of the other anthers. Ovary of 2 adherent carpels; stigma surmounted by a glabrous bilobed appendix. Fruit consisting of 2 follicles, becoming separated later. Seeds many, pubescent and furnished with a pappus. Species 3, natives of the Mediterranean region, Arabia, Persia, India and Japan.

**NERIUM OLEANDER L.** An evergreen shrub like tree, 2-5 m high. Leaves opposed or whorled in threes, lanceolate, acute, entire, coriaceous and glabrous, with a short petiole and many secondary parallel nerves. Flowers large, slightly fragrant, typically of a pink colour, sometimes white or red, or semidouble. Fruit long, almost cylindrical. (S) Mediterranean region. April-October. Cultivated in gardens and avenues and sometimes found self-sown in gardens. E. *Oleander* L. *Leandro*, *Oleandro*, *Mazza di San Giuseppe*. M. *Oliandru*, *Sigret il Giarab*.

#### VINCA L.

Perennial evergreen herbs, prostrate or bushy, with axillary solitary flowers. Calyx 5-cleft. Corolla hypocrateriform, twisted in the bud, with 5 obliquely truncated cunate lobes, tube pentagonal. Stamens 5, with filaments dilated and elbow-shaped; anthers connivent, finishing in a dilated and hairy

appendix. Ovary made of two free carpels with a common style finishing in a stigma bearing a hairy appendix. Fruit made of two free divergent follicles, cylindrical and acuminate. Seeds many, glabrous, oblong or cylindrical. Species 5, natives of Europe, North Africa, West Asia.

VINCA MAJOR L. Sterile stems prostrate or rooting, woody at the base; fertile stems at first erect and herbaceous (2-4 diameter), later on becoming also prostrate. Leaves persistent, opposed, subcordate-ovate or ovate-lanceolate, shining green, with a brief petiole. Flower-stems shorter than the leaves, reflexed when in fruit. Segments of calyx densely ciliated, linear, nearly equal to the tube of the corolla which is large, blue, with obtusely truncated lobes. (P) South Europe and North Africa; naturalised in Central Europe. March-June. Cultivated in gardens, and often naturalised in old gardens, ditches and cemeteries, in *Malta*.

## ASCLEPIADACEAE.

Shrubs and herbs, often climbing and generally perennial; occasionally small trees. Leaves opposed, or whorled or alternate, always simple and usually entire, sometimes rudimentary. No stipules. Flowers actinomorphic, twisted in the bud, hermaphrodite, often produced in axillary umbels. Calyx gamopetalous with 5 segments. Corolla gamopetalous, of 5 segments contorted and usually inequilateral. Stamens 5, inserted on the corolla, more or less united together by their anthers, usually with short fleshy conniving filaments. Anthers introrse 2-4 celled: pollen agglutinated in as many masses as there are cells. Ovary bicarpellary, with 2 styles adherent and capped by 1 stigma. Fruit made of 2 follicles, roundish, either adherent or divergent. Seeds often provided with a pappus. This family includes 215 genera and over 1,300 species, distributed chiefly in the subtropical and tropical regions of both hemispheres. Some species such as *Asclepias* (*Hoya*) *carnosa*. *Stephanotis floribunda*, *Calotropis gigantea*, etc are grown for ornament. *Cryptostegia grandiflora* and *Cryptostegia madagascariensis*, also grown for ornament, furnish india-rubber. *Asclepias curassavica* an American plant also cultivated for ornament, is an emetic and cathartic. Other exotic medicinal plants are *Tylophora asmatika* of India used for dysentery, *Sarcostemma glaucum* is the Venezuelan *Ipecacuanha*, *Hemidesmus indicus* is valued as a substitute for Sarsaparilla. The leaves of species of *Ceropegia* are used as salad. *Stapelia* includes fleshy stemmed species with large flowers having mostly a cadaveric scent, all natives of South Africa, with the exception of *Stapelia europaea* native of Lampeduca. *Cynanchum acutum*, a European species known as Montpellier Scammony, is irritant and drastic. *Asclepias fruticosa* L. (*Gomphocarpus fruticosus* R. Br.) frequently cultivated for ornament and for the production of vegetable silk, is sometimes found self-sown in out gardens.

## PERIPLOCA L.

Small milky and climbing shrubs, or almost erect, with simple opposed leaves. Flowers in corymbose cymes. Calyx deeply divided into 5 segments. Corolla rotate, with 5 spreading or reflexed lobes, and with 5 mucronate and hooked scales on the throat. Stamens 5, forming a tube; anthers adhering to the stigma, hairy on the outside. Ovary of 2 adherent carpels, with 2 styles finishing together into one stigma. Fruit made of 2 cylindrical follicles. Seeds furnished with silky pappus. Species 12, natives of South Europe, the Canaries, North and Central Africa, and the temperate and subtropical regions of Asia.

PERIPLOCA LEVIGATA Ait. A small erect shrub, somewhat voluble (1-1½ m). Leaves coriaceous, linear-lanceolate, narrow at the base, obtuse or somewhat acute at the apex, glabrous. Flowers in small corymbs, on short peduncles, greenish on the outside, glabrous and purplish on the inside, with a whitish spot made of short hairs on each segment. Mature follicles spreading at right angles. (P) Spain, Sicily, North Africa, Syria, the Canaries. Flowers in spring and autumn. Common in the neighbourhood of Ghar Lapsi rare elsewhere in *Malta* as at Wied babu, Wied Encita, Wied il Ghasel, Wied Filep, Dingli. Also in Gozo, as at Xlendi, chambray, Ta Giordan, Ta Cenc, Imgiar ix-Xini.-*Periploca angustifolia* Labill-P *rigida* Viv. E. Wolf-bane or Dog bane. M. Sigret il-harir.

#### CYNANCHUM L.

Perennial herbs with flowers in corymbose helicoidal cymes. Calyx deeply divided into 5 segments. Corolla rotate or campanulate, with 5 lobes, and with a smooth throat. Stamens 5 forming a tube, and having on the outside a petaloid structure of 5-10 lobes. Anthers terminating in a membranous appendix. Ovary of 2 carpels and 2 styles retminating into one capitate stigma. Fruit consisting of 1-2 cylindro-conical follicles. Seeds furnished with pappus. Species over 100, distributed in the temperate and tropical regions of both hemispheres.

CYNANCHUM ACUTUM L. A voluble glaucous herbaceous plant; with opposed, glabrous, entire, round or oval leaves, mucronate at the apex, with roundish wings at the base. Flowers in axillary corymbs, with peduncle, pedicels and calyx pubescent. Corolla small, glabrous, rosy-white, with 5 ovate or oblong lobes. (P) Mediterranean region, as far as Siberia. Very rare. Marsascala (*Malta*) according to Gulia.

### ORD. TUBIFLORAE.

#### CONVOLVULACEAE.

Plant herbaceous or frutescent, generally climbing or voluble, and usually with a milky juice. Leaves alternate and xstipulate, generally simple, rarely wanting. Flowers actinomorphic, hermaphrodite, axillary or terminal, generally borne on simple or trichotomous peduncles usually having 2 bracts, which are sometimes large and form a involucre to the flowers. Calyx of 5 persistent

sepals, usually free. Corolla hypogynous, gamopetalous, campanulate or funnel-shaped or hypocrateriform, with a limb terminating in 5 lobes, or having 5 folds, usually twisted in the bud. Stamens 5, inserted at the base of the tube. Ovary 2-4 celled, with 1-2 ovules in each cell; or 1-celled and 1-ovuled. Style terminal, simple or bipartite. Fruit generally a 1-4 celled capsule, with valves separating at the base sometimes fleshy and indehiscent. Albumen scanty.

The family included 38 genera, with about 950 species, mostly natives of subtropical regions.

In many species the milky resinous juice has purgative or drastic qualities, as in *Exogonium Purga* of Mexico, *Convolvulus Jalapa* and *C. Schiedeana* which furnish Jalap; and in *Convolvulus Scammonia* and *C. sagittaeifolius* from Asia Minor which furnish Scammony. The roots of *Batatas edulis* furnish the well known Sweet-potato and also have purgative qualities which disappear on cooking. Many exotic climbing species of *Ipomoea*, *Cephalandra*, *Quemoclit*, *Argyreia*, *Mimosa* etc are cultivated for ornament.

#### CONVOLVULUS (Tourn.) L.

Herbaceous plants, twining, prostrate or erect. Calyx 5-partite. Corolla conical-campanulate, almost entire, twisted in the bud. Stamens inserted on the base of the tube. Ovary 2-locular, or almost unilocular, owing to incomplete septum. Style 1 with bilobed stigma. Capsule of 2-4 valves with 1-2 seeds in each cell. Seeds smooth, trigonous or hemispherical. Species about 160, natives mostly of temperate regions, and especially of the Mediterranean region.

**CONVOLVULUS OLEAEFOLIUS** Desr. Plant perennial, often prostrate, or erect and shrubby, silvery grey in all parts, 2-4 diameter, with flowering and sterile twigs, these last being densely clad with leaves. Leaves entire, spathulate or oblong-spathulate, the upper leaves near the inflorescence being lanceolate and almost linear. Flowers terminal, in a loose, corymbiform inflorescence, furnished with linear bracts. Calyx villose, with ovate acute segments. Corolla light rose or rosy white, deeper on the outside, large, 3-4 times as long as the calyx. Capsule ovoid (P) Greece and south-east of Italy. April-September. On hilly ground and exposed situations, not too far from the sea. *Malta*, at Gneina, Ghain Tuffieha, Imtahleb, St Paul's Bay, Mistra, Melleha, Bahria, Wied Gherzuma. *Gozo*, at Xaghra, Nadur, Kala. *Cominotto*. - *convolvulus Cneorum Delicata* non L.

**CONVOLVULUS CANTABRICA** L. Plant erect or prostrate, heavily pubescent with spreading or adpressed hairs (2-5 diameter). Radical and lower leaves oblong-spathulate, upper leaves lanceolate. Flowers in loose axillary clusters on a peduncle much longer than the leaf, rarely solitary or geminate. Flower-stalks short, furnished with linear bracts. Calyx hirsute, with lanceolate acuminate segments. Corolla rosy or light pink, with folds deeper coloured and villose externally thrice as long as the calyx. Capsule



globose. (P) Mediterranean region. April-June. *Malta*, very rare. At Imtahleb and Ghain Tuffieha. I. Erba bicchierina, vilucchiello.

CONVOLVULUS DONEATUS L. A perennial silky and silvery plant, with a rootstock and rosettes of leaves at the surface of the soil, or on short stems, and with annual flowering stems 2-20 cm long. Leaves spatulate or lanceolate, limb decurrent on the petiole, or almost linear. Lower flowers solitary, the upper flowers in small clusters with flower-stalks much shorter than the leaves, and with lanceolate segments. Corolla fresh-coloured, more deeply coloured and hairy on the outside, thrice as long as the calyx. Capsule ovate, entirely villose. (P) Mediterranean region and Central Asia. *Malta*, frequent or common at Ahrax, Kammieh, Melleha, Ghain Tuffieha, Gneina, Imtahleb, Puales, Selmun, Mghatab etc. *Gozo*, very common along the country roads and on waste ground not far from the sea at Kala, Nadur, Xaghra, Marsalforno, Kbajjar, Zebbug. *Comino*, frequent at Kala Santa Maria and along road to Hospital and Cmiemen.

CONVOLVULUS SICULUS L. Plant annual, prostrate of a lively green and somewhat villose. Stem simple or branched from the base, rarely slightly voluble, (1-4 diameter). Leaves ovateocordate, acute, the upper leaves having a much longer petiole than the upper. Flower-stems axillary, shorter than the leaf, usually one-flowered. Corolla twice as long as the calyx, pale blue, hirsute externally. Capsule globose, just longer than the calyx, smooth (A) Mediterranean region, Madeira, Canaries. March-June. In fields, gardens, and exposed situations in *Malta* and *Gozo*, but nowhere common.

CONVOLVULUS PENTAPETALOIDES L. An annual green plant, with adpressed hairs, and with prostrate stem, simple or branched at the base, Leaves oblong or linear lanceolate, very acute and ciliated. Flowers axillary, on long one-flowered hairy stems, with two minute bracts about their middle. Calyx glabrous. Corolla twice as long as the calyx, blue, folded externally. Capsule globose and villose, twice as long as the calyx. (A) South Europe and West Asia. March-June. In *Malta*, *Gozo* and *Comino*, with the preceding species and much more frequent on waste rocky and exposed situations.

CONVOLVULUS TRICOLOR L. An annual green plant with prostrate, diffuse, branched stems, or partly erect, and pubescent (1-4 diameter). Lower leaves, obovate, obtuse, petiolate, upper leaves sessile and lanceolate. Flower-stems axillary, long, hairy, one-flowered with 2 minute bracts about their middle. Calyx hairy with lanceolate, acuminate, ciliated segments. Corolla large, 3-4 times as long as the calyx, with azure limb, white throat, and yellow tube, or also with white tube. Capsule globose, villose, shorter than the calyx. (A) Western part of the Mediterranean region as far eastward as Italy and Sicily. April-May. *Malta*, in fields, gardens and valleys, rare, but a real native, although frequently cultivated. Boschetto, Wardia, St Paul's Bay, Puales, Ballut, Tarxien, Zeitun.

CONVOLVULUS ALTHAEOIDES L. A twining plant with perennial rootstock or stolons. Stems 1-10 diameter long, with petiolate leaves. Lower and radical leaves oblong cordate, obtusely toothed or lobed; upper leaves deeply

cordate, pdate-pinnatifid with lobes or toothed segments, the segments of the uppermost leaves being linear and entire. Flower-stalks axillary, longer than the leaf, 1-2 flowered, furnished with linear bracts. Calyx hairy, with oval lobes, the 2 outer lobes being smaller and more hairy. Corolla pink, 4 times as long as the calyx, slightly hairy externally. Capsule smooth, globose. (P) A very variable species, native of the Mediterranean region, Madeira and Canaries. March-June. E. Mallow Bind-weed. I Vilucchio rosso. M. Leblieb tal blat or Leblieb tax-xaghri. Common on rocky wastes, in valleys, along walls of fields etc in *Malta*, *Gozo* and *Comino*.

Var. *italicus* r. et S.-*Convolvulus hirsutus* Ten. This is the typical form of the species, somewhat sparsely seen in *Malta* and *Gozo*, as at Birchircara, Bahria, Imtahleb, Boschetto, Dingli, Xlendi etc., but common in *Comino*. It has larger leaves with broader lobes, lobulate or toothed, more or less villose or hirsute, sometimes with adpressed hairs and silky grey appearance, (form: *scriceus* Choisy.)

Var. *elegantissimus* Mill. Upper leaves with narrow lobes; plant entirely silky or silvery, with paler Flowers.-*Convolvulus tenuissimus* S. et S. More common than the preceding variety in *Malta*, *Gozo* and *Comino*, on rocky wastes, in valleys, along walls of the fields etc. the form *argyreus* D.C. is more silvery with lobulate-toothed lobes.

CONVOLVULUS ARVENSIS L. Plant with perennial rootstock and stolons, glabrous and glaucous, or with slight pubescence and green. Stems striated, prostrate or twining. Leaves petiolate entire, usually hastate, the lower ovate-obtuse, the upper oblong-lanceolate or linear. Flower stalks axillary, as long as the leaf or longer, 1-2 flowered, rarely 3-flowered, with 2 minute bracts. Calyx with ovate-lance late segments, normally glabrous. Corolla white or tinted pink, and glabrous on the outside, 4-5 times as long as the calyx. (P) Europe, temperate Asia, North Africa; naturalised elsewhere. March-October. Common everywhere in *Malta*, *Gozo* and *Comino*, especially during the summer in fields and gardens. The form: *autriculatus* Desr. with hastate-lanceolate leaves, with very divergent and acute lateral lobes, is met with at Birchircara, Vallone Misida and Attard. E. Bindweed. I. Vilucchio. M. Leblieb tar-raba.

CONVOLVULUS SEPIUM L. A perennial herbaceous twining plant, glabrous, with suckers or stolons, and stems 2-3 m long. Leaves cordate-hastate or sagittate, acuminate or mucronate, with long petiole. Flower-stalk equal to the leaf or longer, axillary, one-flowered. Two broad bracts are inserted just below the calyx, and enclose it. Calyx with ovate-lanceolate segments, as the calyx, white or very light rose. Capsule globose 2-valved. (P) Europe, North Africa, West and Central Asia; naturalised in Australia, temperate America etc. May-June-Calystegia sepium R. Br. *Matla*, rare, only found at Boschetto, in the farm "Ta Rapa", along shaded walls and water-channels.

Var. *inflatus* Desf.-*Convolvulus silvestris* W. et K.-C. *silvaticus* W et K.-*Calystegia silvestris* R. et S.-C. *inflata* Strobl. Floral bracts obtuse and mucronate, concave and swollen, covering each other with their margin.

*Malta*; rare, only found at Gneina ilGbir near Rabato, in shaded and cool situations.

### CRESSA L.

Herbaceous, much branched, bushy plants, with minute foliage. Calyx 5-parted. Corolla funnel-shaped, scarious, with 5-parted limb, imbricate in the bud. Ovary 2-locular, with 2 filiform styles, each with a capitate stigma. Capsule 2-valved, with only one ovoid smooth seed. Species 3, natives of warm regions in both hemispheres.

CRESSA CRETICA L. Plant pubescent and ash-grey, with an erect or ascending stem, very much branched from the base (5-20 cm). Leaves small, sessile, ovate or ovate-lanceolate, acute, entire, closely inserted together. Flowers small, axillary, solitary, forming a head-like inflorescence at the end of the twigs. Corolla yellow, villose externally, hardly longer than the calyx. Capsule ovoid. (A) or (P) Mediterranean region, Egypt, Abyssinia and Madagascar. On stiff, clayey and moist soils close to the sea. *Malta*, at Saline where it is frequent, Ghadira is-Safra, bahar ic-Ciaghak to Dragonara point, St. Paul's Bay, Bugibba, Melleha. Gozo; Marsalforno, Kbaijar, Zebbug and Wied iz-Zeit.

### CUSCUTA (Tourn.) L.

Parasitic, rootless and leafless plants, without chlorophyll. Calyx 5-toothed. Corolla fleshy, marcescent, globose-urceolate, with 5 segments, imbricate in the bud. Stamens 5, included. Ovary 2-locular; style simple or bifid. Capsule almost indehiscent, or a pyxidium with 2 cells, with 1-2 seeds in each cell. Flowers sometimes wholly tetramorous. Species about 90, broadly distributed in the warm and temperate regions of the world.

CUSCUTA EPITHYMUM (L). Murr. Stem filiform, red, twining, attaching itself to living parts of the host plant by means of haustoria. Flowers small, in glomerules or heads, almost sessile, at the axil of a bract, and having small bracts along with them. Calyx 4-5 toothed, reddish; corolla of 4-5 obtuse segments, white or wax-like. Stamens 4-5. Tube of corolla hardly longer than the limb with toothed scales inserted along with the stamens (A) Europe, West and Central Asia, Siberia, North Africa; naturalised in North America. March-April. Frequent in *Malta*, Gozo and *Comino*. Parastic on many plants, such as *Urginea maritima*. *Thymus capitatus*, various species of *Trifolium* and *Medicago*, *Vicia cuneata*, *Narcissus Lazetta*, but especially on *Asphodelus ramosus*. -*Cuscuta europaea* b. *Lapithymum* L.-*C. minor* Gilib. E. Dodder. I. *Cuscuta*, *Epitimo*. M. Pittma.

Var. *alba* J. et C. Presl. Stems and flowers white; lobes of calyx and corolla obtuse. With the species, but rare. *Malta*, Wied Encita, on *sphodelus ramosus* and *Urginea maritima*.

Var. *subulata* Tin. Stems and flowers white; lobes of calyx and corolla acute. With the species but likewise rare. *Malta* at Wied Encita on *Urginea maritima*. *Gozo*, at Imgiar-ix-Xini on *Nacissus Tazetta*.

Var. *Trifolii* Bab. Plant vigorous and invading, calyx equal or subequal to the corolla. Common in *Malta*, *Gozo* and *Comino*, on many plants, such as *Euphorbia spinosa*, *Trifolium stellatum* and other species, *Iris Sisyrinchium*, *Scandix Pecten-Veneris*, *Thymus capitatus* *Plantago Serraria* etc.

*CUSCUTA MONOGYNA* Vahl-Monogynella Vahlia Des Moulins, a very rigorous species, with thick red stems, and globose or racemose inflorescence, was detected on rose-bushes at Attard in 1910, but its presence was accidental. It was probably imported along with hemp-seeds used for feeding birds.

## BORRAGINACEAE.

Herbs shrubs, rarely small trees, usually hairy or hispid. Leaves usually alternate, simple, entire. No stipules. Flowers actinomorphic, sometimes zygomorphic, hermaphrodite, rarely dioecious, solitary in the axils of the leaves, or in unilateral scorpioid racemes forming a more or less large inflorescence, corymbose or paniced. Calyx persistent, gamosepalous, with 4-5 segments. Corolla gamopetalous, hypogynous, with 5 lobes, imbricate in the bud. Stamens 5, inserted on the corolla, alternate with the lobes. Carpels 2, more or less distinct, each consisting of two loculi, forming a 4-lobed ovary inserted on agynobase resulting from the thickened base of the style; sometimes the carpels are united. Thus, the style may be wither gynobasic or apical, and the fruit may consist of 4 nutlets or of a drupe with 2-4 seeds. Albumen usually wanting or reduced to a fleshy layer.

The family includes 85 genera and about 1,500 species, distributed chiefly in temperate and subtropical regions, and for the greater part in the Mediterranean region and Central Asia.

The leaves of *Borrigo officinalis* L. have a viscid juice rich in nitrates, and on that account are used in infusion as a diuretic and sudorific. The inflorescence is also, and more frequently, used in the same manner. The root of *symphytum officinale* L is an astringent. A few exotic species are frequently cultivated for ornament, such as *Heliotropium peruvianum*. *Tournefortia fruticosa* and *Echium fastuosum*.

### TRIBE 1. BORRAGEAE.

Ovary formed of 2 carpels, each bifid into 2 loculi, with gynobasic style.

### CERINTHE (Tourn.) L

Herbs with actinomorphic flowers. Calyx deeply 5-parted, with unequal segments. Corolla tubular, 5-toothed, drooping smooth. Stamens with short

filaments. Anthers acuminate, serrated at the margin having at the base 2 twisted appendices connecting the anthers on either side. Stigma obtuse. Fruit consisting of 4 achenes, united in pairs at the base, smooth, of oval shape, dark purple. Species 4, natives of the Mediterranean region and Central Europe.

CERINTHE MAJOR L. Plant annual, erect (3-6 diameter), glaucous. Leaves entire, radical and the lower ones oblong spatulate, decurrent into a broad petiole; the upper leaves oblong, sessile, amplexicaul with 2 round wings, all more or less seabrous, dotted with white callosities, and more or less bristly and ciliated along the margin. Inflorescence at first forming a short and dense raceme, then becoming longer and helicoidal, with cordate oblong bracts. Pedicels shorter than the calyx. Corolla campanulate-ventricose, 5-8 mm in diameter, with broad short triangular teeth, reflexed outwards. (A) South Europe, North Africa, Switzerland. E. Honey-wort. I. Erba Tortora.

Var. *aspera* Roth. Leaves very seabrous, owing to white callosities each bearing a bristle. Bracts green; corolla yellow below and at the apex, and purplish brown in the middle. Frequent in fields in valleys and shaded localities, Wied Encita, Wied Babu, Wied Kirda, Wied iz-Zurriek, Boschetto, Gneina, Melleha, Ahrax etc in *Malta* Wied il Lunziata and Xlendi in *Gozo*. December-May.

The form: *bipallida* Guss-var; *concolor* Ces. with a corolla entirely yellow and green bracts, exists in the Boschetto, San Antonio Gardens and Addolorata Cemetery.

The form: *c. purpurascens* Boiss, with a corolla yellow at the base and the rest purplish brown, and with purplish bracts, exists in Wied Encita and Melleha, and is also frequently met with in fields.

The form; *d. gymnandra* Gasp. With the anthers slightly protruded outside the corolla, is frequent in the Boschetto.

## ECHIUM (Tourn.) L

Herbs or sometimes woody shrubs, with zygomorphic flowers in helicoidal unilateral inflorescences, sometimes collected together in panicles or thyrsi. Calyx 5-parted, with lobes nearly equal. Corolla campanulate-imbutiform, with 5 lobes of which the 2 upper are longer. Stamens with long arcuate filaments, and ovate anthers. Stigma bifid. Fruit of 4 free achenes, ovoid and keeled, more or less reticulate or tuberculate. Species about 30, natives of Europe, Western Asia, North Africa, the Canaries and Madeira.

ECHIUM ITALICUM L. Plant hispid with dense long bristles. Stem usually erect (3-12 diameter). Lower and radical leaves linear-lanceolate and petiolate; the others sessile. Calyx with linear acuminate lobes. Corolla hairy on the outside, equal to or shorter than the calyx, whitish or rosy white. Stamens as long as the corolla. (A) Mediterranean region, the Balkan Peninsula and the Canaries. The plants met with in the Maltese Islands

belong to the variety; a. pyramidatum D.C. e. asperrimum Lam-E. pyrenaicum Desf., with a pyramidal inflorescence, densely hispid with the lower branches longer than the leaves and with a corolla as long as the calyx or slightly longer. April-May. Met with here and there but nowhere common. Along country roads and at Imtahleb, Ta Baldu, Wardia, Gneina, Ghain Tuffieha, Melleha, Ghirghenti, Ghain Il Gbira, Bahria, in *Malta*; and at Imgiar ix-Xini, Xlendi and Marsalforno in *Gozo*

ECHIUM VULGARE L. Plant hirsute and afterwards hispid; stem erect or ascending, simple or more often branched from the base. Radical and lower leaves lineear-lanceolate; the upper leaves gradually smaller. Flowers in racemes forming a pyramidal or irregular panicle, at first short and dense, and afterwards longer and loose. Calyx hispid, u.s. Corolla blue, dark pink or light pink, rarely white, usually longer than the calyx. (B) or (P) Europe, North Africa, West Asia, Siberia, the Azores. Our plants belong to the variety: a. pustulatum S. et S., with a corolla twice or three times as long as the calyx, deep blue or flaked purplish or white; plant very hispid and almot prickly.-E. tubercalatum Hoffg. March-April. Wied Encita, according to Delicata, not collected by others. E. Viper's Bugloss.

ECHIUM PLANTAGIMNEUM L. Plant hirsute, stem erect or ascending, usually branched at the base. Radical and lower leaves oval or oblong-lanceolate, with weel marked secondary nerves, petiolate: the upper leaves lanceolate. Flowers in helicoidal racemes forming an irregular panicle. Corolla 3 or 4 times as long as the calyx (15-30 mm), violet-blue, rarely white, hairy on the outside, with a very short tube, and wide limb with long segments. (A) or (B) The Maltese plants belong to the typical form, having the upper leaves cordate-lanceolate and amplexicaul and the stem covered with fine hairs-E. maritimum Willd. E. violaceum Koch. March-May. *Malta*, along country roads and walls of fields; roads leading to Notabile to Migiarrro and Zebbieh and at Wied Encita. Not frequent.

ECHIUM CONFUSUM De Coincy. Plant hispid, ash-coloured owing to close and adressed hairs or bristles. Stem many, almost erect, simple. Radical and lower leaves almost spatulate without distinct secondary nerves, narrowed at the base; the upper leaves sessile. Flowers in terminal helicoidal racemes, simple or bifid. Corolla 2-3 times as long as the calyx, dark blue, hirsute on the outside. Stamens as long as the corolla, with glabrous filaments. (B) Spain, Calabria, Sicily, North Africa. April-May. *Malta*, at Gneina, according to Delicata.-Echium maritimum Auct. Non Willd. (Del.)

ECHIUM ARENARIUM Gus. Plant hispid and britly, with spreading bristles, usually prostrate or diffuse. Leaves obovate, or linear-lanceolate, restricted at the base; the lower leaves petiolate, often with white tubercles. Flowers in very hispid terminal racemes, helicoid at the apex and usually simple. Calyx with linear lanceolate segments. Corolla violet with a continuous membraneous ring, hairy on the outside, slightly longer than the calyx. Stamens included. (A) or (B) Italy, Sicily, South France, Greece, Egypt, the Canaries-Echium diffusum Guss. Very common along roads, on waste lands and in fields in *Malta*, *Gozo*, *Comino*, *Cominotto*, *Selmun*. February-June.

ECHIAM PARVIFLORUM Moench. Plant u.s. Stems (1-4 diameter); leaves obovate-elongate, the lower petiolate, with callosities or tubercles each having a bristle. Calyx accrescent and campanulate after fertilization. Corolla light blue, with white tube, rarely entirely white, with a ring or 10 distinct scales, nearly equal to the calyx, or even about twice as long. Stamens half the length of the corolla. (A) Mediterranean region, January-June. Very common on waste ground, in fields, and along country roads in *Malta*, *Gozo*, *Comino*, *Comiotto*, *Selmun* and *Filfol*. *Echium calycinum* Viv.-E. prostratum Ten.

#### LITHOSPERMUM (Tourn.) L.

Herbs annual or perennial, sometimes small shrubs, more or less hairy. Flowers actinomorphic. Calyx monosepalous with 5 segments, with gibbosities or folds in the throat. Stamens with very short filaments, and oval anthers. Stigma bilobed-capitate. Fruit of 4 free achenes, smooth or rugose. Species about 40, natives of the temperate regions, chiefly of the northern hemisphere.

LITHOSPERMUM ARVENSE L. Plant annual with adpressed hairs. Stems usually erect, simple, or usually branched above. Lower leaves spatulate, the others oblong-lanceolate or linear, usually with 3 nerves at the base. Flowers white in helicoidal racemes, afterwards much prolonged, with calyces far apart. Corolla small, subequal to the calyx, villose externally, with a cylindrical tube. Stamens included. Achenes rugose-tuberculate (A) Europe, North Africa, West and North Asia, naturalised elsewhere. January-May. Fields, and along walls of fields, especially on clayey soils; but frequent also on red soils in the western part of the Island or *Malta*, and in *Gozo*. E. Gromwell. I. Strigolo selvatico.

LITHOSPERMUM APULUM (L) Vahl. Plant annual, with spreading hairs, and hirsute. Stem erect, simple or multiple, branched above. Lower leaves slightly spatulate, the others linear and acute. Flowers yellow in dense helicoidal racemes; with calyces remaining; close to each other after fertilization. Corolla small, twice as long as the calyx, villose externally, with the tube narrowed above. Stamens included. Achenes tuberculate. (A) Mediterranean region. March-April. Rather rare in *Malta*, at Corradino, Mghatab, Imtahleb, Wardia, Pualet. Frequent in *Comino*-*Myosotis apula* L-M. lutea Lam.

#### MYOSOTIS (Dill.) L.

Annual or perennial herbs, with obovate or spatulate radical leaves and oblong or linear upper leaves. Flowers actinomorphic. Calyx with 5 lobes or teeth. Corolla rotate or funnel-shaped, with a short tube, 5 lobed with 5 gibbosities on the throat, twisted in the bud. Stamens with very short filaments, and ovate anthers, included. Stigma obtuse. Fruit of 4 free ovoid achenes, keeled and smooth. Species about 25, natives of the temperate regions of Europe, Asia, Africa, Australia and North America.

MYOSOTIS ARVENSIS (L) Lam. An annual plant, branched, hirsute, with spreading hairs on all parts including the calyx. Lower leaves petiolate, oblong-spathulate, the others oblong-lanceolate and sessile. Calyx campanulate after fertilization. Flowers united in helicoidal racemes, ramified above. Corolla sky-blue, rarely white; tube shorter than the calyx or subequal to it; limb concave (2-3 mm), shorter than the tube. Style shorter than the calyx. (A) Europe, North and South Africa, Abyssinia, North America, North and Central Asia.

Var. collina Hoffm.-Myosotis hispida Schlecht. Has spreading fruiting pedicels, equal to the calyx. Plant small, 7-30 cm with flowers of a deeper blue. March-May. In arid hilly localities, at St Julians according to Delicata, who calls it in Maltese Uiedniet il Giurdien.

### ANCHUSA L.

Herbs biennial or perennial, hispid and coarse, with annual flowering stems, and flowers in branched helicoidal racemes. Flowers actinomorphic. Calyx more or less deeply divided in 5 segments, slightly accrescent after fertilization. Corolla rotate-campanulate, or funnel-shaped, with 5 lobes, and with the throat closed by 5 concave scales which are very hairy. Anthers oblong, subsessile. Stigma obtuse. Fruit of 4 free achenes, rugose, tuberculate or reticulated, concave at the base.

Species about 40, natives of Europe, West Asia, North and South Africa.

ANCHUSA ITALICA Retz. Plant hispid with long white hairs. Stems erect, 2-7 diameter. Leaves entire, the radical ovate or ovate-lanceolate, and petiolate, the others sessile and lanceolate, rounded at the base. Flowers in helicoid racemes, branched at the top or bifid, forming a panicle. Calyx hispid, erect, with acute linear-lanceolate segments. Corolla azure blue, rarely purplish or white, or purple before complete blooming. Achenes reticulate-rugose. (B) or (P) South Europe, West Asia, North Africa, Siberia, Canaries, Madeira. On clayey soils in the western part of *Malta*, where it is frequent and sometimes abundant, as at Boschetto. Rare on reddish soils and in *Gozo*. March-July. The form: b. angustifolia Guss., with leaves narrowly lanceolate, with a wavy and toothed margin; the form: c. humilis Ten., with narrow lanceolate leaves having entire margins, and short flowering stem; and also the form: c. albiflora mihi., with white flowers, and lanceolate leaves, are met with along with the typical form.-Anchusa paniculata Ait. E. Italian Alkanet, Sea Bugloss. M. Ilsien il Fart.

### BORRAGO (Tourn.)

Plants annual or biennial, rough and bristly, with blue flowers in loose, terminal, helicoid, branched cymes. Flowers actinomorphic; calyx with 5 segments. Corolla rotate, without tube, or with a very short one, having 5 lobes; throat furnished with gibbosities and processes. Anthers conical, riunited in a cone, with short filaments provided with a process on the outer



face. Stigma capitate. Fruits of 4 free achenes, elongated and trigonous, hollow at the base. Species 3, natives of the Mediterranean region.

**BORRAGO OFFICINALI L.** Plant annual, hispid, rough, with many spinescent bristles arising from a tubercle. Stem thick, erect, fleshy (2-6 diameter.), usually branched above. Leaves ovate, denticulate, the lower petiolate, the upper smaller, sessile, partly decurrent. Inflorescence terminal, paniced, made of forked helicoid racemes. Flowers drooping, on a long peduncle. Calyx with 5 acute lobes, spreading, conniving after fertilization. Corolla nearly equal to the calyx, deep blue, usually with a white eye, sometimes light rose or perfectly white (form. *Albiflora* mihi.), with acute lobes and broad emarginate processes at the throat. (A) Mediterranean region. January-May. Frequent on waste grounds, heaps of rubbish, and in valleys in *Malta*, *Gozo* and *Comino*. The white-flowered form is very frequent in the Xlendi valley, *Gozo*. E. Borage. I. Borragine. M. Fidlokom.

#### SYMPHYTUM (Tourn.) L.

Plants perennial, very rough and hairy, with large oval leaves and terminal inflorescence made of small forked racemes, with drooping actinomorphic yellow or purplish flowers. Calyx of 5 segments. Corolla tubulose, clavate, finishing in 5 teeth throat furnished with 5 triangular-lanceolate scales, glandular and toothed at the margin. Filaments long; anthers almost linear. Stigma capitate. Fruit of 4 free oval achenes, hollow at the base. Species about 10, natives of Europe, West Asia and Siberia.

**SYMPHYTUM OFFICINALE L.** Plant hirsute, scabrous, with a large rhizome. Radical leaves large, ovate-oblong, acuminate, with a long petiole; upper leaves lanceolate decurrent on the stem, which is winged, erect, (4-10 diameter). Flowers in a panicle of double racemes; without bracts. Corolla 1-2 cm long, white or yellowish white. (P) Europe and Western Asia. *Malta*, very rare. In moist and shaded localities, at Wied iz-Zurriek and Wied Babu December-May. E. Common Comfrey. I. Consolida maggiore, Simfita. M. Wiednet il Ghomor.

#### CYNOGLOSSUM (Tourn.) L.

Plants annual, biennial or perennial, very villose or silvery owing to the presence of hairs. Flowers actinomorphic in paniced inflorescence made of long, helicoid, forked racemes. Calyx with 5 segments. Corolla rotate-campanulate or tubulose-campanulate, with 5 segments, with the throat closed by 5 scales. Anthers oblong. Stigma capitate and bilobed. Fruit of 4 free achenes, roundish, depressed, furnished with hooked spinelets. Species about 65, natives of subtropical and temperate regions of both hemispheres.

**CYNOGLOSSUM CRETICUM Mill.** Plant annual or biennial, very villose, of an ashy white colour. Stems 2-8 diameter. Lower leaves oblong-lanceolate, the upper cordate-amplexicaul. Racemes without bracts; pedicels long and recurved after flowering, forming a broadly pyramidal inflorescence. Corolla glabrous, blue, with darker veins. (A) or (B)-*Cynoglossum pictum* Ait. South

europe, West Asia, North Africa, Canaries. February-May. Frequent in *Malta*, at Wardia, San Martin, Boscehtto, Gniena, Puales, Wied Kirda, Wied Babu, etc. and in *Gozo*, at Imgiar-ix-Xini, Xlendi, Ta Cenc, Ramla, Nadur, Zebbug, etc. *Comino*. E. Hound's tongue. I. Cinoglossa, Erba vellutina. M. Ilsien il Chelb.

## HELIOTROPIUM L.

Annual or perennial plants, sometimes small woody shrubs, with actinomorphic flowers. Calyx with 5 segments or with 5 teeth. Corolla funnel-shaped, without processes on the throat, but with 5 folds. Anthers included, oval, nearly sessile. Stigma somewhat conical. Fruit of 4 achenes, at first coalescent, and then free at maturity. Species about 120, broadly distributed in warm and temperate regions of both hemispheres.

**HELIOTROPIUM EUROPÆUM L.** Plant green or more usually ash-coloured owing to the presence of short close hairs. Stem erect or ascending, branched (2-4 diameter). Leaves ovate, obtuse, entire, somewhat succulent, petiolate, with prominent nerves on the lower surface. Flowers in helicoid lateral or terminal racemes, these latter forked or dichotomous. Flowers sessile, distichously arranged, white with a yellow throat. Achenes rugose-verrucose or almost glabrous. (A) Central and South Europe, Central and West Asia, North Africa; naturalised elsewhere. April-October. Very common in fields and gardens and along roads, in *Malta*, *Gozo* and *Comino*. E. Common Heliotrope. I. Eliotropio, Erba porraia. M. Ghobbejra bajda.

**HELIOTROPIUM SUPINUM L.** Plant whitish, villose-tomentose, with prostrate stem, much branched (2-3 diameter). Leaves ovate, ash-coloured above; and with prominent nerves, and white and very tomentose on the lower surface. Racemes simple or rarely forked. Calyx toothed and drops off with the ripe fruit. Corolla very small, white with yellow throat. Achenes smooth. (A) Mediterranean region, Tropical Africa, West and Central Asia. Very rare, at Dueira, *Gozo*.

## HYDROLEACEAE.

Herbs or suffrutescent plants, more or less glandular or hairy, or furnished with stinging hairs, sometimes with axillary spines. Leaves alternate, simple, exstipulate. Flowers actinomorphic, hermaphrodite, solitary or in corymbs or scorpioid cymes or spikes. Calyx 5-cleft. Corolla monopetalous, hypogynous, funnel-shaped or sub-rotate, 5-cleft, with imbricate aestivation. Stamens 5, inserted on the tube of the corolla and alternate with the segments, with 2-celled anthers. Ovary more or less two-celled, with two terminal distinct styles and capitate stigmas. Ovules numerous, anatropous. Capsule 2-valved. Seeds minute, angular. Embryo straight, in a scanty fleshy albumen.

The family includes 18 genera with about 170 species natives of tropical and subtropical regions, but chiefly of North America.

## WIGANDIA H.B. et K.

Tall herbs or shrubs, frutescent, rough and hispid, with alternate leaves, broad, rugose, doubly toothed. Flowers in terminal cymes, broadly dichotomous, with sessile flowers on a scorpioid inflorescence. Calyx with linear segments. Corolla with short tube broadly campanulate, with a ringent limb, 5-lobed; imbricate in aestivation. Stamens 5, inserted unequally on the tube, often exserted, filaments hispid on their lower half, and with oblong sagittate anthers. Ovary incompletely two-celled; styles 2, filiform, distinct; stigmas clavate; ovules very numerous in each cell on abundant and inflexed placentae. Capsule two-valved, with valved bearing placenta in the middle. Seeds very numerous, small, alveolate, rugose. Includes 3 or 4 species, very nearly allid, dispersed in the mountainous regions of tropical America.

WIGANDIA MACROPHYLLA Cham. Et Schlcht. A shrub or small tree about 4 m high, with large oval or elliptical leaves, of a lively green, rugose on the upper surface, with whitish hairs. Flowers pale blue in a large scorpioid inflorescence. (P) Tropical South America. March-May. Cultivated at San Antonio and in other gardens at Casal Lia; sometimes met with self-sown.

WIGANDIA CARACASANA H.B. et K. Plant u.s. Leaves rather smaller, of a deeper green, often with yellowish or brown hairs, and with longer petioles; leaves and green parts more viscid, and often with stiff or stinging hairs. Flowers violet blue, with more revolute lobes. (P) Mexico. Cultivated, and often naturalised, at Birzebbugia, St George's (Marsascirocco) and Kaienza.

## VERBENACEAE.

Herbs or woody plants, sometimes large trees, usually with quadrangular stems. Leaves opposite, sometimes whorled, rarely alternate, exstipulate, simple or compound. Flowers zygomorphic, hermaphrodite, rarely solitary, usually in a spike, raceme or head, and usually furnished with bracts. Calyx gamosepalous, tubular, toothed or cleft. Corolla gamopetalous, hypogynous, more or less bilabiate, rarely almost regular, with imbricate aestivation, with 4 or 5 lobes. Stamens usually 4, didynamous, sometimes reduced to 2, rarely 5. Ovary free, with 2-4 carpels, and with a terminal simple style, and stigma usually entire. Ovules solitary or geminate in each cell. Fruit a drupe or a berry, or almost dry. Seeds solitary in each cell, erect or ascending. Embryo straight, exalbuminous, or with very scanty albumen.

The includes 59 genera and about 700 species, distributed in the warm and temperate regions of both hemispheres.

Verbeuaceae contain bitter and astringent principles, and often contain also a volatile oil. Verbena officinalis is a powerful astringent, used in decoction for lotions and for inflamed and bleeding piles and is also a tonic and astringent taken internally. Lippia citriodora, a native of America, has very aromatic leaves with a strong lemon scent and sweet-scented flowers; its leaves are sometimes used in infusion as a tonic and astringent, and also as

expectorant. Such is also the case with several species of *Lantana*. *Vitex Agnus-Castus* is aromatic, and its berries are supposed to be anaphrodisiac, and were formerly slightly roasted and ground, and used as a condiment under the name of Monk's pepper.

#### VITEX (Tourn.) L.

Flowers in clusters on spike-like terminal inflorescence. Calyx 5-toothed. Corolla bilabiate, with short tube; upper lip bifid, lower lip trifid. Stamens 4, didynamous, protruding; filaments hairy at the base; anthers bilocular, with oblong divergent lobes, with resinous glands. Style long, slender, with bifid stigma. Fruit a 4-celled drupe with one seed in each cell, of which one is fertile. Includes about 60 species, chiefly natives of hot countries; only a few being natives of temperate regions of Europe and Asia.

**VITEX AGNUS-CASTUS L.** A deciduous shrub 1-3 metres high. Leaves sweet-scented, opposed, digitate, with 5-7 lanceolate-acute leaflets, green on the upper surface, tomentose on the lower surface, entire or almost entire. Flowers in small clusters on short peduncles, furnished with bracteoles, forming a long dense or interrupted spike-like inflorescence, often branched at the base. Calyx small, tomentose, with teeth much shorter than the tube. Corolla small biolet or violet-mauve, rarely white (form: *albiflora* Strobl.), sometimes rosy pink (form: *rosea* mihi.) The leaflets are more or less laciniate in form: *laciniosa* Cass. (P) Mediterranean region as far as Persia. June-September. *Malta*, rare, at Wied il Baruni in Marsascala, Bahria, Wied Hazrun, Imtahleb, *Gozo*, at Ramla, Wied Bengimma, San Blas, Dahlet Korrot, Boschetto, Zebbug, Imgiar-ix-Xini. *Comino*, Kala Sta. Maria. The form *rosea*, is met with at Ramla and Imgiar-ix-Xini, *Gozo* and at Bahria, *Malta*. The form *laciniosa*, is very rare at Ramla. The twigs are used for wicker-work. E. Common Chaste-tree. I. Agno-casto, Vitice, M. Adiba or Ghadiba.

#### VERBENA (Tourn.) L.

Flowers in solitary spikes, or in spikes forming panicles, or in terminal corymbs. Calyx tubular, with 4-5 folds, and with 4-5 teeth, the posterior one being minute. Corolla more or less tunnel-shape or hypocrateriform, with oblique limb, 5-lobed, and almost bilabiate. Stamens 4, didynamous, included, with very short filaments; lobes of anther parallel. Style thick, stigma bifid. Fruit a 4-celled capsule, septicidal, with one seed in each cell. Includes about 80 species, mostly natives of tropical and temperate regions in the western hemisphere; a few being found in the eastern hemisphere.

**VERBENA OFFICINALIS L.** A perennial herb, often woody at the base, with annual stems. Stem quadrangular, scabrous along the angles, branched above and usually erect. Lower leaves petiolate, lanceolate, toothed; the other tripartite; the upper again lanceolate and toothed or almost entire and sessile. Flowers sessile, in spikes forming a terminal panicle. Spikes very long, slender, interrupted, with oval-acuminate bracts shorter than the calyx. Calyx more or less quadrangular. Corolla with rounded lobes, light pink or white. (P) Europe, Asia, North and South Africa; naturalised in America and

Oceania. April-December. Frequent along roads, walls of fields, heaps of rubbish, valleys etc. in *Malta* and *Gozo*, rare at *Comino*. E. Common Vervain. I. Verbena, Berbena. M. Bukexrem.

VERBENA AUBLETIA L., native of North America, *V. chamaedrifolia* J. of Paraguay, and *V. teucroides* Hook. Of Brazil are frequently cultivated for ornament, and are sometimes found self-sown in gardens.

LIPPIA CITRIODORA Kunth., native of Chili, is an old denizen of our gardens, but rarely matures any seed, and is grown from cuttings.

CLERODENDRON FRAGRANS Willd.-*Wolkameria japonica* Thunb., with double sweet-scented flowers, suckers freely, and is met with half-naturalised in gardens, especially in shaded and cool situations, but is not known to seed.

### LABIATAE.

Herbaceous or suffruticose plants, usually furnished with glands containing a volatile oil. Stem usually quadrangular, with exstipulate leaves, opposed or whorled. Flowers hermaphrodite, very generally zygomorphic, borne in the axils of the leaves, solitary or geminate or in clusters forming false whorls, often in a spike-like terminal inflorescence. Calyx persistent, monosepalous, usually bilabiate, with 2 teeth in the upper lip and 3 in the lower. Corolla monopetalous, hypogynous, sometimes labiate, generally bilabiate with the upper lip entire or emarginate and the lower 3-lobed; sometimes almost actinomorphic and funnel-shaped with 4 lobes or teeth. Stamens usually 4, didynamous, inserted on the tube of the corolla, rarely 2, and more rarely with the loculi of the anthers separated by a filiform connective bearing one loculus at each end, or by abortion at one end only. Ovary free, on a fleshy gynobase, bicarpellary, each carpel bilobed, forming a four-lobed ovary with one ovule in each lobe. Style gynobasic arising from the base of the ovarian lobes, and terminating generally in a bifid stigma. Fruit a schizocarp dividing into 4 free achenes or nutlets, sometimes geminate. Embryo exalbuminous or with scanty fleshy albumen.

This large family includes 157 genera, with about 3,000 species distributed in both hemispheres, especially in temperate regions, being particularly abundant in the Mediterranean region.

Several Labiatae are well-known condiments, such as *Origanum Majorana*, *O. vulgare*, *Ocimum Basilicum*, *Salvia officinalis*, *S. Selarea*, *S. triloba*, *thymus vulgaris*, *Mentha viridis*, *M. piperita*, *Satureja hortensis*, *Rosmarinus officinalis*. Many others have aromatic or bitter principles owing to which they are used in medicine or in perfumery. *Salvia officinalis* and the nearly allied *S. triloba* have been long used as tonics and stomachics. *Marrubium vulgare* and to a certain extent also *Ballota nigra* are used as powerful tonics and colagogues, especially in jaundice. These two plants are almost devoid of aroma but have a very bitter principle marrubina. So also is *Ajuga Iva*, which is used as tonic and diuretic and is said to be a good remedy for gravel. *Marubium vulgare* is used also for coughs. *Mentha piperita* is extensively

cultivated, especially in England for the production of oil of peppermint, and is a powerful carminative and stomachic. By refrigerating the oil of peppermint to -5°C menthol is obtained in a crystallized form. This camphor like substance is used externally and internally in headaches and also as a disinfectant. From *Thymus vulgaris* an oil is obtained which yields thymol, a powerful disinfectant now more generally obtained from *Ptycotis Ajouan*, an Umbelliferous plant. An infusion of *Melissa officinalis* is credited with carminative and stomachic properties, and *rosmarinus officinalis* is used for warm baths for children. The oil of Rosemary is used in perfumery in lotions for the hair. The oil of *Lavandula Spica* is used for the same purpose. Many species of *Satureja*, *Nepeta*, *Stachys* and *Betonica*, were formerly much used in medicine.

#### TRIBE AJUGEAE.

Herbs or suffruticose perennials, with a corolla almost unilabiate, the upper lip being very short or wanting, the lower lip, being trilobed or 5-lobed. Stamens 4, didynamous, the anterior pair being longer.

#### AJUGA L.

Floral leaves differing little from the cauline. Flowers solitary, geminate or in false whorls. Calyx campanulate with 5 teeth, nearly equal. Corolla bilabiate; the upper lip much reduced, with 2 teeth or lobes; lower lip 3-lobed. Stamens 4 didynamous, and parallel: anthers with loculi at first divergent, then confluent. Fruit of 4 rugose achenes, with lateral insertion. Style bifid. Species about 45, natives of the eastern hemisphere.

**AJUGA REPTANS L.** A perennial stoloniferous herb, with many underground stems. Flowering stems erect, simple, 1-3 diameter high, hairy on alternate sides. Leaves usually of a dark metallic green: radical leaves large, oblong or obovate, forming a rosette, entire or sinuous, narrowing to a long petiole; the cauline leaves with shorter petioles. Flowers in axillary clusters, of 6 to 12, in the axil of oval-obtuse bracts which are sessile, violet-blue, the upper bracts being smaller and deeper coloured. Calyx hairy, with lanceolate teeth. Corolla 6-9 mm long, blue rarely pink and more rarely white, with a straight cylindrical tube. (P) Europe and Asia Minor. January-April. *Malta*, rare, at Wied Balluta according to Delicata, and at San Antonio Gardens. The plants cultivated in the public gardens are reproduced from native plants which existed in San Antonio Gardens.-*Bugula reptans* Mill.-*Ajuga genevensis* Solla. E. Common Bugle. I. Bugula, Morandola.

**AJUGA IVA (L.) Schreb.** Plant perennial and woody at the base, very branched and woolly with decumbent stems ½ to 2 diameter long. Leaves linear or linear-lanceolate, with 2 or 4 teeth at their upper portion, the uppermost leaves being entire. Flowers solitary or geminate at the axil of the leaves, at first (January-March) cleistogamous, afterwards casmogamous, sometimes wholly cleistogamous (form: *pinnatifida* Forskall.) Calyx woolly, with lanceolate obtuse teeth shorter than the tube. Corolla large (in casmogamous flowers), purple, with funnel-shaped tube, lower lip trilobed

with the median lobe large and obcordate. (P) Mediterranean region. January-June. *Malta*, *Gozo* and *Comino*, frequent on uncultivated and rocky wastes, along country roads and on heaps of rubbish.-*Teucrium Iva* L.-*Ajuga moschata* Schreb.-*Teucrium moschatum* Lam. E. Herb Eve or Musky Bugle.

Var. *Pseudo-Iva* rob, et Cast. In D.C. Corolla golden yellow. Leaves more convolute along their margin, and more hairy, usually ash-coloured. Frequent in *Malta*, *Gozo* and *Comino*, replacing the species along country roads. In sandy places and on dry clayey soils.

**AJUGA CHAMAEPITYS (L.) Schreb.** An annual herb, branched at the base, with decumbent stems 1-2 diameter long. Leaves linear or linear-lanceolate, the lower entire, narrowed to a petiole, the upper trifid. Upper flowers forming a spike-like leafy inflorescence. Calyx villous, with narrow acute teeth, rather unequal, not longer than the tube. Corolla yellow, glabrous or hairy, with a large median lobe in the lower lip, of a deeper yellow, dotted or streaked black. (A) Mediterranean region, Central Europe, Persia. March-April. *Malta*, very rare, at Wied Balluta and Wied Babu according to Delicata and Gulia.-*Teucrium Chamaepitys* L.-*Bugula Chamaepitys* Scop.-*Chamaepitys vulgaris* Ling. I. Camepizio, Canapicchio.

Var, *grandiflora* Vis. Corolla 10-12 mm long, about three times as long as the calyx. Flowers only just shorter than the floral leaves.-a. *Chia Delivata* non Schreb. *Malta*, very rare, at Wied Babu according to Delicata and Gulia. E. Ground Pine Bugle.

## TEUCRIUM L.

Herbaceous or suffruticose plants. Flowers axillary, solitary or geminate, or forming a head. Calyx campanulate or tubular, with 5 about equal teeth, with the tube somewhat swollen anteriorly. Corolla almost one-labiate, without nectariferous hairs, and with the upper lip bifid, its two lobes spread forward, so that the corolla appears to be 1-labiate and 5-fid. Stamens 4, didynamous protruding between the lobes of the upper lip. Style simple with a bifid stigma. Fruit of 4 ovoid achenes, smooth or rugose. Includes about 100 species natives of temperate and warm regions of both hemispheres.

**TEUCRIUM SPINOSIUM L.** A herbaceous plant, woody at the base, with many spreading branches terminating in a spine. Lower leaves oblong, petiolate, pinnatifid; upper leaves ovate-lanceolate, entire, or more or less deeply cut. Bracteoles spinous, the lower usually trifid. All the plant is pubescent and viscid. Calyx hispid and glandular, with spinous teeth. Corolla small, whitish, twice as long as the calyx. Achenes globose, black, with white transparent glands. (P) Mediterranean region. May-July. *Malta*, very rare, Tal Ghalja, according to Delicata. *Gozo*, very rare, Ta Cenc and Ta Harrax, according to Gulia.-*Teucrium mucronatum* L.-*Scordium spinosum* Cav.

**TRUCRIUM FRUTICANS L.** A suffruticose woody plant, very branched, with white woolly branches. Leaves oval oblong, shining green on the upper surface, white and tomentose on the lower surface, petiolate, the floral leaves

being smaller and usually more acute, flat or with convolute margin, often wavy or crisp. Calyx white and woolly, with triangular or lanceolate, acute teeth. Corolla, large, pale violet or mauve, rarely white (form: *albiflora*), veined darker, with acute oblong-lanceolate lobes, the middle lobe being much larger and longer. Achenes brown, pubescent. Anthers purplish. (S) Mediterranean region. January-June. *Malta*, *Gozo*, *Comino* and *Cominotto*, very common on rocky and waste lands, walls of fields, rocky valleys etc. The form: *intermedium* Guss. with broad oval leaves is frequent in sheltered or shaded localities. E. Narrow-leaved Germander. M. Zebbugia.

**TEUCRIUM SCORDIUM L.** Plant perennial and stoloniferous, pubescent-villous, with an erect or ascending stem more or less branched, 2-5 diameter high, with stolons having leaf-like bracts. Leaves sessile, villous, crenate, the cauline leaves being lanceolate, the upper leaves narrower and entire in their lower half. Flowers usually geminate, and shorter than the leaves. Calyx villous-pubescent, slightly swollen at the base, with lanceolate acuminate teeth. Corolla pale purple or lilac, with lanceolate lateral lobes. Achenes brown, alveolate. (S) Europe, Western, and Central Asia, North Africa, Abyssinia. It does not appear that the typical form of this species exists anywhere in the Maltese Islands.

Var. *scordioides* Schreb. Plant more robust, up to 6 diameter high, with more erect and more branched stems, and stolons furnished only with scarious bracts. Cauline leaves oval, cordiform at the base and partly amplexicaul; the upper leaves broadly oval, rounded at the base, crenated along the whole margin. Flowers more densely inserted in false whorls, the upper flowers being only just shorter than the upper leaf. Corolla purple. Plant more woolly.-*Teucrium lanuginosum* Hoffm. Et Link. April-May *Malta*, rather rare, at Fiddien, Wied il Kleigha, Imtahleb, Bahria, Wied Gherzuma, Wied Hazrun. *Gozo*, rare, at Wied il Lunziata according to Gulia. E. Water Germander. I. Erba-aglio, Scordio.

**TEUCRIUM FLAVUM L.** Plant suffruticose, woody at the base and older twigs, erect, shrub-like, with ashy pubescent branches, 2-4 diameter high. Leaves broadly oval, almost truncated at the base, the upper leaves with a short petiole, crenated, usually coriaceous and deep shining green on the upper surface, the floral leaves being smaller, sessile, concave and entire. All the leaves are somewhat hairy on the upper surface, paler and tomentose on the lower surface. Flowers geminate or ternate forming a leafy false-spike, more or less unilateral. Calyx pubescent, glandular, with unequal lanceolate teeth. Corolla greenish yellow, often shaded brown, with upper lobes rectangular and large, the lateral obtuse and the median lobe concave and almost orbicular. (S) South Europe and North Africa. April-July. *Malta* and *Gozo*, very common on rocky uncultivated wastes, slopes of valleys, and in stony places; rare at *Comino*. Often cultivated in gardens for edgings. The form: *glaucum* Jord. Et Four. With leaves entirely glabrous, and green, not shining, somewhat glandular on the lower surface, is met with at Boschetto and Wied Encita.-*Chamaedrys flavus* Moench. M. Borghom.



TEUCRIUM CHAMAEDRYIS L. Plant perennial, more or less hairy, suffruticose and branched at the base with ascending branches 2-3 diameter long. Leaves petiolate, oval-lanceolate, crenated, deep shining green on the upper surface, pubescent on the lower surface. Flowers geminate or ternate, forming a rather dense false-spike, more or less unilateral, with floral leaves hardly differing from the others. Calyx with short hairs and lanceolate-acuminate teeth. Corolla rosy purple, very rarely white, with the upper and lateral lobes acute; the median lobe being large, concave, obovate with crisped margin. Achenes brown, papillose. (P) Mediterranean region and Central Europe. April-July. *Malta*, very rare at Wied Balluta, according to Delivata. *Gozo*, also very rare, at Xlendi, according to Gulia.-*Chamaedrys officinalis* Moench.-*Teucrium officinale* Lam. E. Wall Germander. I. Camedrio, Querciola. M. Borghom.

TEUCRIUM MARUM L., is sometimes cultivated in gardens for ornament and as a cephalic.

#### TRIBE II-ROSMARINEAE.

Corolla bilabiate. Stamens 2. Achenes smooth.

#### ROSMARINUS (Tourn.) L.

Flowers in axillary clusters forming leafy false-spikes, terminal and more or less unilateral, with floral leaves hardly differing from the others. Calyx campanulate, bilabiate. Corolla bilabiate, with a tube protruding beyond the calyx, swollen at the throat, with the upper lip straight, hardly bilobed, and the lower lip trilobed, the lateral lobes being oblong and straight, and the median lobe much larger, concave, emarginate. Upper stamens wanting or rudimentary; lower stamens directed under the upper lip and protruding, with a tooth just above their insertion on the throat of the tube. Style simple, reflexed at the base, with bifid stigma. Achenes four, oblong, inserted ventrally. Includes only one species.

ROSMARINUS OFFICINALIS L. A woody, shrubby plant, much branched, up to 2m high. Leaves sessile, coriaceous, persistent, linear, with reflexed margin, green and glabrous on the upper surface, white and tomentose on the lower surface. Calyx white and tomentose on the lower surface. Calyx white and tomentose. Corolla bluish, very rarely white, (form: *albiflorus* Beg.). (S) Mediterranean region. Flowers more or less all the year. In rocky valleys and wastes and in dry situations. *Malta*, rather rare, at Gneina, Bahria, Wied Hazrun, Boschetto, Wied Babu, Wied Kirda, Dueira, Bingemma, Wied Gherzuma, Melleha. *Gozo*, rare, at Wied Bingemma and Wied ir-Rihan. The typical form: *erectus* Pasq. Is rare, at Boschetto, Wied Hazrun, Naxaro and Gneina; it has an erect habit of growth with stiffer branches and dark green foliage. The form: *humilis* Ten.-*prostrata* Hort.-var. *rupestris* Pasq., has more slender decumbent or prostrate stems, never rising more than 50 cm but spreading for 150 cm or more, with foliage of a lighter green, and is the form more frequently met with. Both forms, especially the typical erect one, are often cultivated in gardens. E. rosemary, I. Rosmarino. M. Clin.

## TRIBE II-PRASIEAE.

Corolla bilabiate; stamens 4, didynamous. Achenes drupaceous with a fleshy pericarp.

### PRASIUM L.

Calyx persistent, campanulate bilabiate, upper lip trifid, lower bipartite. Upper lip of corolla concave, the lower trifid with ovate-lanceolate lobes, the median larger and almost entire. Tube of corolla with nectariferous hairs. Stamens 4, didynamous, directed under the upper lip of the corolla. Anthers bilocular, inserted below the apex of the stigma. Achenes four, drupaceous, subglobose and rugose. Includes only one species.

**PRASIUM MAJUS L.** Plant suffruticose, woody at the base, with erect, ascending or spreading twigs, herbaceous at the end, quadrangular, whitish and slightly hairy, 2-5 diameter long. Leaves petiolate, green, ovate-lanceolate, often cordate at the base, crenated, almost glabrous on the upper surface, slightly hairy on the lower surface. Flowers solitary, in the axil of the upper leaves. Calyx large, campanulate, pubescent and glandular, green. Corolla large, white. (P) Mediterranean region and Madeira. February-June. *Malta* and *Gozo*, common in rocky and stony localities, on walls of fields, fissures of rock etc. The form: *microphyllum* Nic., with smaller leaves, and corolla often streaked purple is met with in the more exposed localities-*Prasium minus* L-P. *creticum* Rchb. E. Great Spanish Hedge-Nettle. I. *Te siciliano*. M. *Te skalli*.

## TRIBE IV-MARRUBIEAE.

Calyx 5-10-toothed. Stamens and style included within the tube of the corolla. Plants herbaceous, annual or perennial, often thickly tomentose.

### MARRUBIUM (Tourn.) L.

Flowers in axillary clusters, often furnished with a slender bracteole not longer than the calyx. Calyx tubular, with 5 principal teeth and often with 5, smaller teeth alternating with the first. Corolla bilabiate with a tube shorter than the calyx, furnished with nectariferous glands, with the upper lip erect, entire or emarginate, and lower lip trilobed, with rounded lateral lobes, and larger obovate median lobe. Stamens 4, included; anthers bilocular. Style reflexed at the base; stigma with lower lobe spoon-like, covering the upper. Achenes 4, smooth and glabrous, triangular. Includes about 30 species, natives of Europe, North Africa, and temperate Asia.

**MARRUBIUM VULGARE L.** Plant perennial, suffruticose, with a stout stem, much branched, 3-5 diameter high, thickly covered with white tomentum. Leaves oval-orbicular, petiolate, cordiform or rounded at the base, bullate, irregularly crenate, with a crisp or wavy margin, more or less pubescent or villose on both surface; uppermost floral leaves sessile. Bracteoles awl-

shaped, recurved, not longer than the calyx, spinescent at the tip. Calyx with 10 teeth, of which 5 are alternately longer, awl-shaped and recurved. Corolla whitish, with a bifid upper lip (P) Mediterranean region, Europe as far Northern India; naturalised in North America. April-June. *Malta*, rare, at Li Glin, Notabile, Bahria, Gharghur, Tarxien, Selmun, Pualet, Wied il Lunziata, Wardia, Attard; *Gozo*, rare, Rabato and Gran Castello on heaps of rubbish, in stony places and neglected corners; often cultivated to have it handy as a popular remedy for coughs and jaundice. Both the form: *villosum* Strobl. With pubescent but green leaves, and the form: *apulum* Ten. with very woolly whitish and smaller leaves are met with, this last being found at Attard, Li Clin and Bahria. E. White Horehound. I. Marrobbio, Robbio, Erba apiola. M. Marrubja bajda or Marrubija.

#### SIDERITIS L.

Flowers in axillary clusters or forming false spikes. Calyx tubular-campanulate, with spinescent teeth. Corolla bilabiate, with tube included within the calyx, with an erect upper lip, and a 3-lobed lower lip, the median lobe being larger and emarginate. S4, included, the upper 2 much shorter than the others. Anthers of lower stamens often abortive. Style included stigma u.s. Achenes 4, obovate, minutely pitted. Includes about 45 species, natives of the Mediterranean region and the Canaries.

**SIDERITIS ROMANA L.** Plant annual, herbaceous villous and prostrate or ascending, branched from the base, 5-30 cm long. Lower leaves petiolate, the upper sessile, oval-oblong, obtuse, toothed in their upper half. Flowers axillary, equal to or longer than the corresponding leaf, in clusters of 5 to 6. Calyx bilabiate; upper lip oval and entire, spinescent; lower lip 4-toothed, spinescent. Corolla white, slightly longer than the calyx; upper lip entire and obtuse; lower lip 3-lobed, lobes rounded, the median much larger and obovate. (A) Mediterranean region. March-June. Frequent in valleys, on rocky wastes, on uncultivated ground and along country roads in *Malta*, *Gozo* and *Comino*- *Sideritis spathulata* Lam.-*Burgsdorfia rigida* Moench-B. *romana* Hoffm. Et Lk.

The form: *pauciflora* Nic., with axillary clusters of only 2 or 3 flowers, is frequent in dry and arid localities. The form: *approximata* Gaspar. In Guss., a larger plant, more villous and branched, with a dense inflorescence, commencing at the base of the stem is frequent at Wied Encita. Wardia, Boschetto etc. e. Ironwort.

#### TRIBE V-NEPETEAE.

Stamens 4, ascending, the posterior pair longer than the anterior, calyx usually with 15 nerves.

#### GLECHOMA L.

Flowers axillary solitary or in clusters of 2-5, with small bracteoles. Calyx of 5 equal teeth. Corolla bilabiate, upper lip straight and bifid, lower lip with

median lobe emarginate or obcordate. Stigma bifid, with equal lobes. Achenes oval. Includes 6 species, natives of Europe and temperate Asia as far as Japan: naturalised in North America.

GLECHOMA HEDERACEA L. Plant perennial, herbaceous with prostrate and rooting stems, and with erect flowering stems. Lower leaves reniform, the others larger and cordate, petiolate, obtusely toothed, glabrous or more usually hairy. Flowers in axillary cluster of 2-5, with pedicels shorter than the calyx, reflexed when in fruit. Calyx with lanceolate teeth, broad at the base, and acuminate, shorter than the tube. Corolla violet-blue, rarely pink or white. Achenes brown and smooth. (P) Europe, Asia Minor as far as Siberia and Japan, and North America. March-June. *Malta*, cultivated and often naturalised in gardens. Used in domestic medicine for coughs. E. Ground Ivy. I. *Edera terrestre*. M. *Edera terrestri*.-*Nepeta Glechoma* Caruel.-*Calamintha hederacea* Scop.

#### TRIBE VI-STACHYDEAE.

Corolla bilabiate. Stamens 4, didynamous, at first parallel, afterwards divergent.

#### PHLOMIS (Tourn.) L.

Plants perennial, rarely herbaceous, usually suffrutescent, more or less hairy. Flowers in axillary clusters, with bracteoles. Calyx tubular. 5-toothed,. Corolla bilabiate: tube included, with nectariferous hairs at the throat; upper lip large, shaped like a helmet, more or less villose; lower lip spreading, 3-lobed, with the median lobe very large, emarginate or bilobed. Stamens 4, filaments partly adherent to the tube, upper filaments with a hooked appendix at the base. Stigma bifid; upper lobe much shorter. Achenes 4, triangular, obliquely truncated at the apex, smooth or hairy. Includes about 50 species, natives of the Mediterranean region and temperate Asia.

PHLOMIS FRUTICOSA L. A fruticose or shrubby plant, with woody stems 2-10 diameter high, mostly covered with a thick white tomentum. Leaves large, oval-elliptical or oblong, 3-8 cm long, with a long petiole, white and tomentose especially on the lower surface. Flowers usually in solitary axillary clusters of about 20 flowers. Calyx hispid with subequal teeth terminating in a short awn. Corolla yellow. Achenes with hirsute apex. Bracteoles oval-lanceolate shorter than the flowers. (S) Italy, Sicily, Sardegna, Dalmatia, Greece, Candia,. March-June. *Malta*, Wied Encita, Wied il Ghasel, Misrah Ghonok, Majesa, Melleha, Ahrax, Boschetto, dingli, etc. Not common; one of our finest native plants. The form: *montana* Guss. with more greenish leaves on the upper surface, and narrower bracteoles is found at Wied Encita.-*Phlomis ferruginea* Groves non Ten. E. Jerusalem Sage. M. *Salviun*. *Salvia tal Madonna*.

#### LAMIUM L.

Flowers in axillary clusters, with floral leaves similar to the rest. Calyx tubular or tubular-campanulate, with 5 acuminate teeth. Corolla bilabiate; upper lip helmet-shaped, with a narrow base; lower lip 3-lobed, with lateral lobes small and angular, and median lobe broad, narrow at the base, with 2 teeth-like appendices. Stamens 4, anthers bilocular with oblong cells. Stigma bifid, with awn-like lobes. Achenes 4, prismatic, truncated at the base. Includes about 40 species, natives of Europe, North Africa and temperate Asia.

**LAMIUM AMPLEXICAULE L.** An annual herb, branched at the base, with erect or ascending slender stems, more or less hairy, 5-30 cm long. Lower leaves petiolate, rounded-cordate; the upper almost sessile reniform; all crenate-lobate. Flowers in clusters of 6-10, without bracteole. Calyx hispid, with awl-shaped ciliated teeth. Corolla purplish, with a tube about 3 times as long as the calyx in chasmogamous flowers; much reduced or included in the calyx in cleistogamous flowers in December-January. Rarely white (A) Europe, Western Asia; naturalised in North America. December-May. *Malta*, common in fields, gardens, among growing crops, and in valleys and on uncultivated ground. Less common in *Gozo* and *Comino*. E. Henbit Archangel.

#### BALLOTA L. Gen.

Calyx tubular or funnel-shaped, with 5 acute spine-scent teeth and often with intermediary acute teeth. Corolla with a cylindrical tube, almost included, with glandular hairs on the throat, bilabiate; the upper lip being erect or ascending and emarginate; the lower lip 3-lobed, with oblong lateral lobes and obovate emarginate median lobe. Stamens 4, with the lower part of filaments flattened and hairy. Stigma bifid, with subequal awn-like lobes. Achenes 4, oblong or ovate, glabrous or pubescent. Includes about 25 species, native mostly of the Mediterranean region.

**BALLOTA NIGRA L.** A perennial, suffrutescent, bushy plant with quadrangular erect stems 3-5 dm high. Leaves all petiolate, broadly oval, rounded-truncated or cordate at the base, bullate, crenate, acute or acuminate, dark green, more or less tomentose especially on the lower surface. Bracteoles many, linear, not spinescent. Flowers sessile, clustered on a short peduncle in the axil of the leaf. Calyx funnel-shaped, with mucronate spinescent teeth, when in fruit spreading out almost at right angles, and with pubescent tube. Corolla pale pink, rarely white, with the upper lip villose externally. Achenes brown, smooth, small. (P) Europe, North Africa, West Asia; naturalised in North America. April-November. *Malta*, rare at Tarxien, near Addolorata Cemetery where it is frequent, Casal Dingli, Gomerino, Burnahhala, Selmun, Pualet, St Paul's Bay. *Gozo*, more rare, at Munxjar near Sannat and near the Capuchins' Convent. Often used in domestic medicine instead of *Marrubium album*. E. Stinking Horehound. I. Marrobbio fetido, Cimiciotto. M. Marrubja scuda.

Var. *meridionalis* Beg. Leaves cuneate at the base, sometimes cordate. Plant more robust and more hairy, and of lighter green. Teeth of calyx often

recurved, tube more hairy.-*Ballota foetida* Lam. With the species at Tarxien close to Addolorata Cemetery, and at Wied Babu.

## STACHYS L.

Flowers in axillary clustering forming terminal false spikes, with floral leaves more or less modified as bracts. Calyx tubular-campanulate, 5-toothed, the posterior tooth being often larger than the others. Corolla bilabiate, with tube included or exserted; upper lip emarginate or bifid; lower lip reflexed, 3-lobed with large obovate median lobe. Stamens 4, filaments often hairy at the base. Stigma bifid, with short filiform equal lobes. Achenes 4, oblong. Species about 180, natives mostly of temperate regions, except in Australia and New Zealand.

**STACHYS HIRTA L.** Plant annual with an erect or ascending stem, hirsute with white hairs, 1-4 diameter long. Leaves very hairy, ovate-elliptical, cuneate at the base, crenate, the lower petiolate, the upper sessile or subsessile. Flowers in axillary clusters of 2-3, forming a terminal false spike, with small hairy awl-shaped bracteoles. Calyx hispid, with 5 hairy lanceolate teeth, prolonged into a plumule. Corolla yellowish, longer than the calyx, with purplish spots on the lower lip and with nectariferous hairs on the throat. Achenes tubercled (A) Mediterranean region, Canaries, Madeira. March-May. *Malta*, rather rare, at Wied Encita, Boschetto, Ta Laurenti, Imtahleb, Gneina, Ghain Tuffieha, Wied il Ghasel, Corradino. *Gozo*, rare, at Pergla and Nadur. *Galeopsis hirsuta* L.-*Tetrahitum hirtum* Hoffg. Et Lk.-*Sideritis Ocymastrum* L. e. Hedge Nettle. I. Basilico selvatico.

## TRIBE VII-SALVIEAE.

Corolla bilabiate; upper lip concave. Fertile stamens 2, the other pair wanting or reduced to staminodes: anthers with very developed connective.

## Salvia L.

Flowers u.s. Calyx tubular or campanulate, bilabiate; upper lip entire with 2 or 3 teeth; lower lip with 2 teeth. Corolla bilabiate; upper lip straight or curved, concave or folded longitudinally, entire or emarginate; lower lip 3-lobed. Upper stamens wanting or rudimentary, lower stamens fertile with a large and long connective of which the anterior branch bears a part of the anther, the anterior cell; and the posterior branch bears the other part of the anther, often sterile, or rudimentary. Stigma bifid at the tip. Achenes 4, oval-trigonous, smooth. A large genus, including about 500 species distributed in temperate and warm regions of both hemispheres.

**SALVIA OFFICINALIS L.** Plant suffrutescent, much branched, greenish grey, hairy, with erect stems, 5-10 diameter long. Leaves oval or oval-lanceolate, crenate, rugose, the lower rounded or cordate at the base, the upper sessile and acute; young leaves very hairy and whitish. Flowers on short pedicels, in clusters of 3-4, forming a dense false-spike with oval acuminate bracts. Calyx campanulate, pubescent or villous but not viscid, with lanceolate mucronate

teeth. Corolla violet blue or rarely whitish, twice as long as the calyx. (P) South Europe. April-june. On rocky ground in exposed situations. *Malta*, rather rare, at Boschetto, rocky ground from Boschetto to madliena and Dingli, Gniien il Cbir, Bahria, Imtahleb, also frequently cultivated as a condiment, and is often used in domestic medicine for tonic and stomachic infusions. The form: *auriculata* Mill.-*Salvia confusa* Benth, with leaves bearing one or two round lobes at the base, is met with on the rocky ground near Boschetto on more robust plants in less dry situations. E. Common Sage. I. *Salvia*. M. *Salvia*, *Salvia ta Malta*.

*SALVIA TRILOBA* L. fil. Plant u.s., more robust. Leaves u.s. larger, and more densely hairy on the lower surface, always with two or more lobes at the base. Flowers in clusters of 4-6, provided with small bracts, forming a dense false spike u.s. Calyx smaller. Corolla twice or thrice as long as the calyx, reddish-violet. The rest u.s. (P) Italy, Greece, Candia, Western Asia and Algeria. April-July. *Malta*, rare, at Halluca. Cultivated for the same object as the preceding, and often naturalised in old gardens.-*Salvia auriculata* et *S. fruticosa* Mill.-*S. Sipylea* Lam. M. *Salvia*, *Salvia ta Franza*, *Salvia ta Skallia*.

*SALVIA VERBENACA* L. A perennial herb, with annual flowering stems 2-5 diameter high. Leaves oblong, rarely ovate, petiolate, crenate, and often slightly lobate; upper leaves corlate at the base and amplexicaul. Flowers in clusters of 2-5 forming a false spike. Flowers of various types: hermaphrodite flowers large, with corolla up to 13 mm long, female flowers and cleistogamous flowers smaller; violet blue, or blue, sometimes almost pink, rarely white. Calyx hispid. (P) Europe, and the Mediterranean region; naturalised in North America. February-May. The typical form must be rare in the Maltese Islands.-*Salvia Verbenaca* var *vulgaris* Caruel,-*S. Verb.* Var *sinuata* Vis.-*Horminum Verbenaceum* Mill.

Var. *clandestina* L. Leaves irregularly crenate; pinnatilobed, more often oval than oblong. Flowers usually blue, rarely white (form: *albiflora* Strobl), with hermaphrodite flowers longer than 15 mm. Plant rarely more than 3 diameter high.-*Salvia praecox* Savi non Vahl.-*S. hiemalis* Brot-S *pallidiflora* S. Am. October-May. In exposed situations, on uncultivated ground, along country roads etc. Common everywhere in *Malta*, *Gozo* and *Comino*; often used in infusion for coughs. E. Wild Sage. M. *Salvia salvagga*, *Salvia tal Madonna*.

Many species of *Salvia*, such as *S. splendens*, *S. Grahmi*, *S. argentea* L., *S. Horminum* L. are cultivated for ornament and the last named is occasionally met with self-sown in gardens.

#### MELISSA (Tourn.) L.

Flowers in axillary clusters, with oval-lanceolate bracts. Calyx tubular campanulate, bilabiate, with 3 teeth in the upper lip and 2 in the lower. Tube of corolla curved upwards, expanding into a swollen throat, bilabiate; upper lip erect and emarginate, lower lip 3 lobed with median lobe large and obcordate. Stamens 4, convergent below the upper lip; filaments without appendix, cells of anthers divergent. Stigma bifid, with awl-shaped equal lobes. Achenes 4,

oblong, glabrous, smooth, keeled on the outside. Species 3, natives of South Europe and Central Asia.

MELISSA OFFICINALIS L. Plant perennial, often woody at the base, with erect branched stem 5 to 8 diameter high, slightly hairy in all its parts, having a pleasant odour of sweet verbena or of lemon. Leaves with a long petiole, oval or oval-elliptical and deeply crenate or with shorter petiole and less deeply crenate. Flowers in clusters of 6-12. Corolla at first yellowish and then rapidly becoming white or very pale pink, less than 1 cm, longer than the calyx. (P) Mediterranean region and the caucasus; naturalised in North America. May-July. In valleys and cool situations. *Malta*, rare, at Boschetto, San Martin and Puales. *Gozo*, rare at Xlendi and Pergla. Often cultivated and found growing self-sown in gardens. E. Balm. I. Cedronella, Citraggine, Appiastro. M. Melissa, Naghnieh in-nahal, also known as Burieha in *Gozo*.

#### SATUREJA (Tourn.) L.

Flowers hermaphrodite or polygamous in axillary clusters, with or without bracteoles, often forming terminal false spikes. Calyx campanulate or tubular, often almost bilabiate, with equal teeth. Tube of corolla equal to or longer than the calyx. Corolla bilabiate; upper lip straight entire, or emarginate; lower lip trilobed with median lobe generally larger. Stamens 4, connivent under the upper lip. Stigma bifid. Achenes 4, oval or elliptical, glabrous, smooth or granulose. Includes about 130 species, natives of temperate regions, chiefly of the Mediterranean region.

SATUREJA GRAECA L. A perennial herb, woody at the base, with many slender prostrate or ascending twigs, 2-4 diameter long, more or less pubescent. Leaves small, the lower ovate, the upper linear, with revolute margin. Stems many, pubescent with adpressed hairs. Flowers in loose clusters, on rather short peduncles, small; corolla pink, about 2 mm longer than the throat of the calyx. Calyx with awl-shaped ciliated teeth, and with hairy throat. Bracteoles much shorter than the calyx. (P) Western and Southern Europe, Western Asia, North Africa. March-July. *Malta*, rare, at Wied Balluta and Ghain il Cbira, according to Delicata.-*Micromeria graeca* Benth.

Var. *congesta* Briq. Flowers in dense clusters on a short peduncle. Lower leaves lanceolate or almost rhomboid, upper leaves linear; corolla 3-4 mm longer than the calyx.-*Satureja tenuifolia* Ten.-*S. graeca* var. *glomerata* Terr. A.-*Micromeria graeca* var. *densiflora* Benth. Glacis at Floriana, near Sa Maison.

SATUREJA MICROPHYLLA Guss Plant u.s. deep green, usually more or less glabrous when growing in dry rocky situations, or very villous and whitish in more favourable localities. Leaves small, oval, or roundish, or oblong, more or less obtuse, with revolute margin; floral leaves hardly different from the lower. Flowers in loose clusters on a short peduncle, with a linear bracteole as long as the peduncle. Calyx more or less glabrous, with almost erect teeth. Corolla pale pink, slightly longer than the calyx, casmogamous in



spring and early summer, cleistogamous and much reduced in winter. Achenes elliptical and obtuse. (P) Italy, Islands between Italy and Africa, Candia. January-July. *Malta*, *Gozo*, *Comino* and *Cominotto*, very common on rocky and waste lands, along country roads etc-*Thymus melitensis* D'urv-Th. *Microphyllus* D'urv.-*Micromeria microphylla* Benth-*Piperella filiformis* Presl. Sometimes used as a diuretic in gravel and diseases of the bladder, under the name of "spaccapietra" or "sghatrija".

**SATUREJA NEPETA (L) Scherle.** Plant perennial, rhizomatous, with stems woody at the base, 2-4 diameter high, tomentose with adpressed hairs, greysih green. Leaves rather small, oval or oval-elliptical with a short petiole, obtuse or ounded, slightly toothed or entire, with a pleasant but strong scent. Flowers on long pedicels in loose axillary clusters, forming a rather dense inflorescence. Calyx bilabiate, 6-7 mm long, with subequal teeth, covered with short hairs. Corolla rather small, in hermaphrodite flowers, about 1 cm long, in female flowers only 5 mm long. Achenes brown, oval, obtuse. (P) Mditerranean region and Central Europe; naturalised in North America. May-November. *Malta* and *Gozo*, frequent on rocky and uncultivated ground, along country roads, walls of fields, heaps of rubbish etc.-*Melissa Nepeta* L.-*Thymus Nepeta* Sm.-*Calamintha Nepeta* Savi.-*Satureja Calamintha* var. *Nep ta Briq.* E. Lesser Calamint I. *Nepetella*. M. *Kammilta*. The following forms are met with: b. *tenuiflora* Beg-*Calamintha Nepeta* var. *tenuiflora* Goir with a long and narrow tube of corolla; c. *canescens* Beg.-*Thymus Nepeta* var. *canescens* Guss., plant villous and whitish; d. *athonica* (Bernh.) Beg, plant almost glabrous and of a deeper green usually found in shaded calities.

**SATUREJA HORTENSIS L (E Savory. I. Santoreggia)** is sometimes cultivated as a condiment.

## THYMUS L.

Flowers hermaphrodite or polygamous in small axillary clusters, forming a false terminal spike or a head. Calyx campanulate or somewhat tubular, hairy at the throat, bilobed; upper lip with 3 teeth connate for more than half their length; lower lip with 2 teeth deeply divided. Corolla bilabiate, with the lower lip 3-lobed, lobes subequal. Tube of corolla straight, not exserted, throat smooth. Stamens 4, exserted, subequal, anthers with 2 oval parallel cells. Stigma bifid, with short divergent lobes. Achenes 4, oval, smooth and glabrous. Species about 50, with few exceptions natives of the Mediterranean region.

**THYMUS CAPITATUS (L.) Hoffg. Et Lk.** A suffruticose plant, much branched from the base, diffuse, with stiff erect stems, tomentose and white, those not bearing flowers becoming spinescent at the tip, 1-6 diameter high. Leaves sessile, entire, linear-elliptical, acute, with slightly convolute margin, scabrous, hirsute, dotted with glands, highly fragrant. Floral leaves densely imbricate, oval, ciliated and hirsute on the outer surface, often coloured, enveloping the calyx. Flowers in false whorls forming a very dense oval or oblong head, cone-like, furnished with ciliated lanceolate bracteoles subequal to the calyx. Calyx tubular, hirsute, ciliated at the margin, with the upper teeth very short

and convergent, and lower teeth linear and ciliated. Corolla pink, rarely white (form: *albiflora* mihi.), with tube slightly exerted, thrice as long as the calyx (S) Mediterranean region. April-August. On rocky, stony arid ground, very common in *Malta*, *Gozo*, *Comino*, *Selmun Island*. Occasionally produces a first crop of flowers in December and January. Largely made use of as firewood. The exquisite quality of Maltese honey is due to the very abundant and aromatic nectar of the flowers of this plant.-*Satureja capitata* L.-*Thymbra hirsuta* Brenner plant.-*Satureja capitata* L.-*Thymbra hirsuta* Brenner-*Thymbra capitata* Guss.-*Coridothymus capitatus* Rehb. E. Wild thyme (local name). I. Sataro. M. Saghtar.

*Thymus vulgaris* L., the common thyme, cultivated as condiment, is nowhere met with really naturalised.

### ORIGANUM (Tourn.) L.

Flowers in panicles or corymbs of terminal false spikes, with floral leaves modified into broad concave bracts. Calyx campanulate, or tubular-campanulate, with a hairy throat and 5 subequal teeth, sometimes unilabiate, being cleft anteriorly flown to the base; lower lip rudimentary. Corolla with tube more or less exerted, smooth at the throat, bilabiate, upper lip erect and emarginate, lower lip with 3 subequal spreading lobes. Stamens 4, divergent. Stigma bifid, posterior lobe shorter. Achenes 4, oblong or ovoid, glabrous and smooth. Species about 25, natives mostly of the Mediterranean region.

ORIGANUM VULGARE L. Plant perennial, woody at the base, much branched from the base forming a large rootstock, with stems up to 7 diameter high, more or less hairy and glandular. Leaves oval or elliptical, petiolate, pubescent or almost glabrous, slightly crenated or almost entire, green or slightly tinged purple. Flowers in oval or oblong false spikes forming a panicle or a corymb-like inflorescence. Calyx large, with a tube 2 mm long, with oval lanceolate acute teeth. Corolla pale pink or rarely white, with a straight tube about 5 mm longer than the throat of the calyx. Stamens and style much longer than the corolla in hermaphrodite flowers. Achenes oblong, brown, smooth. (P) Europe, Western Asia as far as Siberia. May-August. Cultivated and occasionally naturalised in old gardens and around farm-houses, as at Siggieui and Curmi (*Malta*). E. Pot Marjoram or Common Marjoram. I. Regamo, Acciughero. M. Riegnu.

The forms usually cultivated are: *biglabrescens* G. Beck with leaves partly coloured or margined purple, and *c. creticum* L.-*Origanum megastachyum* Link with elongated and prismatic false-spikes grouped in corymbs forming large panicles.

ORIGANUM MAJORANA L. A suffruticose plant with a knotty stem, often branched and rooting from the base, 3-4 diameter high, with erect tomentose or almost glabrous herbaceous twigs. Leaves petiolate, oblong or oval, entire, tomentose on both surfaces, and whitish. Flowers in ovoid dense false spikes, smaller than in the preceding species, in small inflorescence, having smaller and roundish bracts glandular and hairy, of the same colour as the

leaves. Corolla usually white, sometimes pale pink rarely purplish. (P) North Africa, Central Asia and Arabia. May-August. Cultivated, and often almost naturalised in old gardens, as at Attard, Balzan, Birchircara, Wardia, Gomerino, etc. e. Sweet Marjoram, I. Maggiorana, Persia. M. Mertkux.-Majorana hortensis Moench.

ORIGANUM DICTAMNUS L. A perennial plant with a rootstock, and stiff stems 15-40 cm high, very tomentose with long silvery hairs. Leaves large elliptical or oval, about 1½cm long, the upper sessile, entire, with prominent nerves, and thickly tomentose on both surfaces. Flowers purple, on drooping spikes, made of small axillary more or less globose spikelets with green or reddish bracts. One tooth of calyx much prolonged. Corolla very ringent, somewhat compressed: upper lip short and bifid; lower lip with three acute lobes, the middle one being much longer. Plant with warm aromatic flavour, frutescent and suckering. (P) Candia and the East. *Malta*, very rare, at Gnien il Cbir; possibly accidental. E. Dittany of Crete.

#### MENTHA L.

Flowers in axillary clusters, often forming continuous or interrupted false spikes, more or less dense. Calyx campanulate-tubular, with 5 euql teeth, or bilabiate. Corolla almost actinomorphic, tube almost included, with equal lobes, the upper 2 being connate. Stamens 4, exserted, with straight divergent filaments, and bilocular anthers with parallel cells. Stigma bifid, with enqual lobes. Achenes 4 elliptical smooth or finely dotted. Includes about 25 species, natives of temperate regions.

MENTHA ROTUNDIFOLIA (L.) Huds A perennial stoloniterous plant, with underground rhizomes furnished with scales. Stems erect, tomentose, branched at the top, up to 4 diameter high. Leaves sessile, obtuse, suborbicular, cordate at the base, obtusely or rarely acutely crenated, with prominent reticulated nerves, and with pluricellular ribbon-like, often branched, hairs. Flowers in very dense and rather long false spikes, with lanceolate bracts. Calyx small, globose, with short teeth. Achenes smooth and glabrous. (P) Europe, North Africa, North America and Mexico. May-October. *Malta*, rare, at Gnien il Cbir, Boschetto and San Antonio.-*Mentha spicata* var *rotundifolia* L e. Long-spiked Mint. M. Naghnieh salvagg.

Var. *villosa* mihi. Plant very villose with long white hairs; leaves narrower and longer, often oval-oblong; false spikes rather long, usually 5-8 cm long. May-August. San Antonio, close to an open tank. Probably a hybrid between *M. rotundifolia* (L.) Huds. and *M. longifolia* (L.) Huds.

MENTHA VIRIDIS L. Plant perennial and stoloniferous u.s. Leaves sessile or petiolate, glabrous or more often pubescent, with prominent nerves and acute teeth, usually light green. Flowers forming false spikes u.s., but more slender, with linear bracts glabrous or ciliated. Pedicels of flowers and base of calyx glabrous; calyx campanulate, with linear teeth. Corolla pale bluish violet or whitish. Achenes glabrous, finely dotted. (P) Europe, South Africa, the

Canaries. May-August. Commonly cultivated for condiment, and often naturalised in gardens, fields and valleys.-*Mentha picata* var. *viridis* L.-*M. spicata* Huds. E. Spear Mint I. *Mentha* comune. M. Nagnieh.

**MENTHA AQUATICA L.** Plant u.s. with stems up to 8 diameter high, stout and rigid; more or less hairy, with stiff simple, pluricellular hairs. Leaves petiolate, oval-oblong, elliptical or roundish, nerves not prominent, margin toothed or crenate, deep green, strongly scented, usually with the odour of bergamot. Flowers in clusters, on peduncles, forming a terminal dense oval or roundish false spike or head. Calyx tubular, regular, with lanceolate teeth. Corolla actinomorphic, tubular, hairy internally. Achenes somewhat verrucose. (P) Mediterranean region, Europe as far as Siberia, Madeira; naturalised in North America. June-November. *Malta*, very rare, at Boschetto and Marsa but sometimes cultivated as an aromatic herb for medicinal purposes.-*Mentha hirsuta* L. M. Nagnieh salvagg, Nagnieh taz-ziemel.

**MENTHA PULEGIUM L.** Plant perennial, stoloniferous, with few underground stems and with sterile long prostrate stems, often rooting, glabrous or hairy 2-5 diameter long. Flowering stem, stiff, erect, branched from the base, rooting near the base, glabrous or hairy, 1-3 diameter high. Leaves with a short petiole, elliptical or obovate, obtuse or subacute at the apex, almost entire or slightly toothed, without prominent nerves, strongly scented like all the plant. Flowers in dense axillary clusters, with short pedicels forming a long false spike, interrupted at least at the base. Calyx funnel-shape, almost bilabiate, hairy at the throat, about 2 mm long, with ciliated and hairy teeth, about half as long as the tube. Corolla pale purplish-blue, cylindrical below, expanded and gibbose at the throat, with few hairs. (P) Central and Southern Europe, North Africa, Western Asia, Canaries, Madeira; naturalised elsewhere. April-August. Common in *Malta*, *Gozo* and *Comino*, in valleys, fields, along roads, on uncultivated and waste ground, especially in places with stagnant humidity. E. Pennyroyal. I. Puleggio. M. Pleiju. Sometimes used in domestic medicine as an emmenagogue; also yields a stomachic and carminative distilled water.-*Pulegium vulgare* Pers.

Var. *erecta* Mill. Plant glabrous or slightly hairy, with short stiff erect stems, or with prostrate sterile stems, with smaller rounded or oval leaves, very obtuse. Leaves of the erect flowering stems are oblong-lanceolate subacute, slightly toothed. Flowers purplish violet in long dense spikes, sometimes pure white (form: *albiflora* Micheletti). Common in valleys and moist localities.

Var. *tomentosa* Sm. Plant very hairy, greyish or whitish, with applied hairs. False-spikes shorter and more dense, of a paler colour, sometimes pure white (form: *albiflora* mihi). Common in fields, along roads, and in drier situations. The form: *hirsuta* Per. With hirsute stems and foliage, is also frequent.-*Mentha Pulegioides* Sieb. non L.-*Pulegium vulgare* var. *incanum* Per.

**OCIMUM BASILICUM L.**, the common basil, is cultivated in many varieties, as a summer annual, for use as condiment, and I sometimes found self-sown in gardens.

## ORD. PERSONATAE.

### SOLANACEAE.

Herb or shrubs, rarely small trees. Leaves alternate, simple, exstipulate, the upper leaves being usually geminate, one of them being smaller than the other. Flowers actinomorphic, hermaphrodite, often extra-axillary, solitary, or variously grouped in racemes often helicoid, corymbs or panicles. Calyx gamosepalous, with 5 lobes or segments, rarely 4-6, persistent, sometimes accrescent. Corolla hypogynous, gamopetalous, rotate, campanulate, funnel-shaped or hypocrateriform, usually with 5 lobes or segments, and with various aestivation. Stamens inserted on the tube of the corolla, alternate with the segments. Ovary of a carpels, antero-posterior, set obliquely with the axis of the flower, forming a 2-celled ovary. Style terminal simple. Ovary numerous campylotropous. Fruit a capsule, usually septicidal, or a pyxidium or a berry fleshy or dry. Seeds many, compressed, often reniform. Albumen abundant and fleshy. Embryo curved or annular with semicylindrical cotyledons.

The family includes 70 genera, with about 1,600 species, natives of tropical and temperate regions, chiefly of central and south America.

The Solanaceae contain an acrid juice and alkaline narcotic principles, and are often poisonous. The roots and the leaves of *Atropa Belladonna* contain atropine an alkaloid of extreme potency. *Hyoscyamus niger*, and also our native *H. albus*, contain various alkaloids of which Hyosciamine is the most powerful. Scopolamine is an alkaloid of identical composition and properties found in *Scopolia myoporoides* of Dalmatia. The leaves of *Datura Stramonium*, *D. Tatula*, *D. fastuosa*, *D. humilis*, frequently cultivated for ornament, as well as those of *D. Metel* naturalised in ditches and gardens, contain daturine and are smoked in asthma. The seeds contain a larger dose of this substance and are very poisonous. The leaves of *Nicotiana Tabacum* are the well-known tobacco, and contain the well-known glucoside nicotine, which exists in still heavier doses in the leaves of *Nicotiana rustica*. Several species are well known vegetables such as *Capsicum baccatum* the very known vegetables such as *Capsicum baccatum* the very pungent cherry pepper, and *C. annuum* the Cayenne pepper which is cultivated in many varieties, including tasteless or sweet forms. *Solanum tuberosum* is the well-known potato, the tuber of which is extensively used as an article of food. *Solanum Melongena* is the mad-apple or "brinjal" of our gardens and *Solanum oviferum* is the white egg-plant also used for food. *Lycopersicum esculentum* is the ubiquitous tomato, and *Solanum muricatum*, *S. quitoense*, *S. laciniatum* etc. also furnish edible fruits.

### DATURA L.

Herbaceous plants, annual or perennial, or small shrubs, with woody stem. Flowers solitary, axillary but in reality at the bifurcation of the stem. Calyx

tubulose, often angular, 5-toothed, or divided longitudinally on one side, separating at the base by an annular rupture after fertilization. Corolla large, tubulose-campanulate, folded longitudinally and contorted in the bud, 5 to 10-toothed. Stamens erect, with long filaments. Style filiform with a bilamellate stigma. Capsule with 4 incomplete cells, usually septifragous. Seeds many reniform, rose-alveolate, with a curved embryo. Species about 15, natives of tropical and subtropical regions, especially of Central America.

**DATURA METEL L.** A small shrub-like herbaceous plant, annual or almost perennial (5-10 diameter), densely and softly pubescent. Stem erect, dichotomously branched above. Leaves ovate, unequal at the base, petiolate, almost entire. Flower-stalk very short. Flowers 15-20 cm long. Calyx somewhat bladder-shaped, with unequal acuminate segments. Corolla large white, twice as long as the calyx, with the limb terminating in 10 acuminate teeth, sweet-scented. Capsule globose, reflexed, covered with soft, equal, rather short thorns. (A) or (P) Native of tropical America. May-october. Naturalised in South Europe, North Africa and India. Naturalised in the Valletta Main Ditch and in other ditches around fortifications; in San Antonio Gardens etc. e. Downy Thorn-Apple. M. Stramoniū abjad.

**DATURA STRAMONIUM L., D. Tatula L., D. humilis Desf.** and other species are frequently cultivated.

#### HYOSCYAMUS (Tourn.) L.

Herbaceous annual or perennial plants, more or less hairy. Flowers with short flower-stalk or almost sessile, in long, often branched, on sides leafy racemes or spikes. Calyx urceolate, 5-toothed. Corolla imbutiform, with a short tube, somewhat curved, the limb terminating in 5 rounded lobes. Stamens with long filaments curved backwards. Style filiform, with a globose stigma. Capsule a bilocular pyxidium, surrounded by the accrescent and coriaceous calyx. Seeds reniform, rugose-tuberculate. Species 11, natives of Europe, Asia, North Africa and the Canary Islands.

**HYOSCYAMUS ALBUS L.** Plant very pubescent with long soft hairs, giving it a hoary appearance. Stem erect or ascending, branched from the base (2-8 diameter). Leaves all petiolate, roundish-ovate, the lower often cordiform, obtusely lobed or toothed; the floral leaves or bracts ovate-lanceolate and entire. Lower flowers with a short peduncle; upper flowers sessile. Calyx urceolate, with prominent nerves and short teeth. Corolla yellow, or yellowish white, greenish or purplish at the base. (A), (B) or (P) Mediterranean region and the Canaries. Flowers almost all the year. Very common along roads, around buildings on heaps of rubbish, along walls of fields etc., in *Malta*, *Gozo* and *Comino*. E. White Hen-bane. I. Giusquiamo bianco. M. Mammazeiza.

The form: major Mill., is a larger plant in all its parts, with yellow flowers purple at the base, and stalked lower flowers; it is frequent in gardens, around fortifications etc.

#### NICOTIANA (Tourn.) L.

Plants annual or perennial, herbaceous or woody and shrub-like. Flowers in terminal and lateral panicles, sometimes in heads more or less dense. Calyx tubulose-campanulate, with 5 teeth. Corolla imbutiform or gypocrateriform, 5-lobed, folded and twisted in the bud. Stamens erect, with long filaments. Style filiform, with capitate-bilobed stigma. Capsule enveloped by the calyx, septicidal, with bifid valves, dehiscent near the apex. Seeds small, almost reniform, rugose-reticulate. Species 41, mostly natives of tropical and temperate America, a few natives of Australasia; some of them extensively cultivated and naturalised.

**NICOTIANA GLAUCA** Grah. A shrub with woody stem and branches, smooth and glaucous. Stem erect, branched (1-3 m). Leaves with a long petiole, ovate-cordate, the upper ovate-lanceolate, acute or acuminate, entire, or sometimes slightly sinuous and dentate and then also with petioles slightly winged. Flowers in a large loose panicle. Calyx with 5 short ciliated triangular teeth. Corolla yellow, tubulose, pubescent, restricted at the throat, with very small 5-toothed limb. Capsule hanging and subequal to the calyx. (S) Native of South America. April-October. Cultivated and naturalised: *Malta*, on and around the fortifications, in ditches, along the railway, in sea-side places, and occasionally in valleys and on waste ground; *Gozo*, at Chambray, Xlendi, Marsalforno, Imgiar-ix-Xini, Gran Castello etc; *Comino* at Cala Sta. Maria and near the Hospital.-*Nicotiana arborea* Dietr. M. Tabac tas-suar.

**NICOTIANA RUSTICA** L. native of South America, Mexico and Texas, a species heavily charged with nicotine, and occasionally cultivated for the production of a yellowish grey snuff of great potency, is sometimes met with naturalised in old gardens.

**PETUNIA NYCTAGINIFLORA** Juss., native of La Plata is another escape from cultivation, being frequently met with naturalised in old gardens.

#### LYCIUM L.

Woody shrubs with small entire leaves, and more or less spinous. Flowers solitary or in small clusters. Calyx cup-shaped, 5-toothed, afterwards splitting irregularly in 2-5 segments. Corolla tubulose or funnel-shaped, 5-lobed. Stamens erect, with long filaments. Style filiform, with capitate stigma. Fruit a bilocular berry, enveloped by the irregularly split calyx. Seeds many, reniform. Species about 70, natives of temperate and subtropical regions, mostly of South America.

**LYCIUM EUROPAEUM** L. A very spinous, erect, much branched shrub, with spreading rigid branches, with a whitish bark, and almost entirely glabrous, (1-3 m). Leaves spatulate, lanceolate, or ovate, somewhat fleshy, with a short petiole, pale green, often produced in tufts or clusters. Flowers solitary or sometimes geminate, on a short stalk, erect and sweet-scented. Corolla light pink or almost white, tubulose-funnel shaped, with a limb shorter than the tube, divided into 5 ovate lobes. Stamens longer than the tube but shorter than the limb, with filaments hairy at the base. Berry ovate-globose, about 1 cm

long, red, orange, or yellow. (S) Mediterranean region and Arabia. April-May. *Malta*, rare, along walls of fields, and in rocky places; fortifications of Valletta and Floriana, Fort Manoel, Wardia, ghemieri, Imgiebah. Gozo also rare, at Wied il Ghasri.-*Lycium mediterraneum* Dun. E. European Box-thorn. I. Spina-Christi, Agutoli. M. Ghauseg.

**LYCIUM CHINENSE** Mill. A shrubby plant, with weak or hanging stems and branches, throwing up suckers from the roots and forming a large clump, with few slender spines, or spiny only at the end of the twigs, (1-2 m). Leaves petiolate, not fleshy, larger than in the preceding species, deep green, smooth, the rest u.s. Flowers often in clusters of 2 or 3. Corolla purplish violet, with a limb equal to the tube. Stamens longer than the limb. Berry elongated, 1-1½cm long, of a lively crimson. (S) Native of Eastern Asia. April-June, or later. First detected as naturalised in the Valletta Main Ditch in 1905, whence it has spread to other ditches and fortifications around Valletta and Floriana, and at Misida, Sliema and St Julians.

The local plants belong often to the variety: *ovatum* Lois, with ovate or ovate-lanceolate leaves, and an ovate-cylindrical berry, obtuse at the apex.

#### SOLANUM (Tourn.) L.

Plants annual or perennial, herbaceous or shrubby. Flowers solitary, or more often in corymbose cymes. Calyx 5-toothed or 5-parted, sometimes reduced to 4 or increased to 6 or 10, and sometimes accrescent in the fruit. Corolla rotate, with a short tube, folded, 5-parted, sometimes 4-10 parted. Stamens 5, with very short filaments, connivent. Style filiform, with a capitate stigma. Berry fleshy, with 2, or sometimes more, cells. Seeds many, reniform. Species nearly 900, natives of temperate and tropical regions, chiefly of America.

**SOLANUM NIGRUM** L. Plant herbaceous, erect, branched, without thorns, pubescent or almost smooth, annual or perennial, more or less strong-scented (2-5 diameter). Stem usually dark purple, with spreading branches. Leaves petiolate, dark green, ovate, entire, or angular and toothed. Flowers in corymbs, umbel-shaped on short stalks, extra-axillary, and without bracts. Corolla small, white, with acute segments. Berries globose, not larger than a pea, black, on reflexed pedicels. Plant only slightly pubescent and villose. (A) or (P) Native of temperate and subtropical countries all over the world. April-November. Frequent in *Malta*, *Gozo* and *Comino*, along roads, walls of fields, and in moist localities.-*Solanum vulgare* L. (Heg.).

Var. *moschatum* J. et C. Presl. Plant almost smooth; inflorescence racemiform, with pedicels reflexed after flowering. Leaves with angular margin, with broad acute segments. The rest u.s.-*S. nigrum* var. *patulum* Guss. Frequent in irrigated fields and in valleys in *Malta* and *Gozo*, as at Gneina, Wardia, San Martin, Pualet, Ghajn-rihana, Wied il Lunziata. E. Black-Nightshade. I. Ballerina, Morella. M. Gheneb id-dib.



Var. *miniatum* Bernh. Plant pubescent or villose; branches angular and partly winged. Inflorescence umbel-shaped. Leaves almost entire, or obtusely toothed, or acutely angular. Berries scarlet, with reflexed pedicels.-*Solanum puniceum* C.C. Gmel.-*S. alatum* Moench.-*S. villosum* Mill. M. Tuffieħ tas-serp. With the species, *Malta*, *Gozo* and *Comino*; often more frequent.

**SOLANUM SODOMAEUM L.** Plant perennial, woody at the base, thorny in all its parts. (2-20 diameter). Leaves sinuate-pinnatifid, thorny on both sides, petiolate, with obtuse segments and rounded angles, thorns yellow. Flowers in small, simple or bifid corymbs, extra-axillary with pedicels reflexed after flowering. Calyx thorny, with ovate-lanceolate segments, accrescent after flowering. Corolla violet, 2-2½ cm in diameter, with triangular acute segments. Berry large, globose or somewhat depressed, yellow at maturity. (S) Native of the Cape of Good Hope; extensively naturalised in the Mediterranean region, Mauritius, Australia, etc. April-October. First detected in 1913 at Musta near the Victoria Lines and afterwards at St Paul "tat-Targa". Rare. The plants existing in the public gardens were raised from seed of the Musta plants.

All the local plants belong to the variety: *Hermanni* Dun., having purple branches; with leaves having a few stellate hairs on both surfaces, but otherwise smooth: and the calyx thickly covered with long white thorns.

**SOLANUM TUBEROSUM L.** the Potato, *S. Lycopersicum* L. the Tomato, both native of South America, *S. Melongena* L. and its variety *S. ovigerum* Dun. Native of the East Indies, and *Capsicum annum* L. the Cayenne Pepper, are extensively cultivated in many varieties and forms, but none of them has become naturalised. *Capsicum baccatum* Hort. a variety of *C. annum* with small foliage and small roundish pungent scarlet berries is however frequently found self-sown in gardens and kitchen-gardens where it was once grown.

## PHYSALIS L.

Herbaceous plants, often woody at the base, or with perennial rootstock. Flowers axillary, solitary or in clusters. Calyx with 5 segments, very accrescent after flowering, becoming bladder-shaped. Corolla rotate-campanulate, with a very short tube, folded and 5-lobed, twisted in the bud. Stamens 5, erect. Style filiform; stigma capitate. Berry globose, bilocular, fleshy, within the bladder-shaped calyx. Seeds many, compressed, reniform. Species about 40, natives mostly of America.

**PHYSALIS SOMNIFERA L.** Plant perennial, erect, branched, woody, except the young shoots, tomentose with stellate hairs and ash-coloured (3-10 diameter). Leaves with a short petiole, ovate or oblong, entire, the upper surface becoming almost smooth with age. Flowers in axillary clusters, small, with short stalks which become reflexed after flowering. Corolla hardly longer than the calyx, greenish yellow. Anthers yellow. Berry as large as a pea, red, enclosed in a green or reddish calyx. (S) Native of the Mediterranean region as far as India, Africa, and the Canary Islands. May-September. Long

naturalised in many gardens, as at San Antonio: possibly formerly a native. The dry leaves are used as diuretic.-*Withania somnifera* Dun.

**PHYSALIS PUBESCENS L.** Plant usually perennial, much branched, diffuse, woody at the base, very tomentose in all its parts. Leaves cordate-ovate, acuminate. Flowers solitary, axillary, with peduncle reflexed at maturity. Corolla yellow, with 5 violet spots, nearly 3 times as long as the calyx, which is very accrescent and forms a large bladder after flowering. Anthers violet. Berry yellow or greenish yellow, enclosed in the green calyx. (A) or (P) Native of South America. E. Cape Goose-berry. I. Alchechengi. M. tuffieh tal fanali.

Var. *peruviana* L. Mostly perennial, with entire or roughly toothed leaves, not clammy.-*Physalis edulis* Sims. Cultivated for the sake of its edible berries, and often naturalised in gardens, as at Attard, Wardia etc.

#### NICANDRA ADANS.

Herbaceous plants, with solitary axillary flowers. Calyx 5-parted, with 5 prominent wing-like angles, accrescent after flowering. Corolla campanulate. Stamens with filaments dilated at the base. Berry 3 or 4-locular, becoming dry at maturity. Species only one.

**NICANDRA PHYSALOIDES (L.) Gaertn.** Plant glabrous, with erect stem, branched above. Leaves ovate or oblong, sinuate or toothed, often cuneate at the base, and decurrent on the petiole. Flower stalks short, reflexed after flowering. Calyx with broad segments, prolonged into a reflexed appendix. Corolla violet-blue, white at the base. Berry small, greenish yellow. (A) Native of Peru; naturalised elsewhere. June-September. Self sown since 1902 and naturalised in San Antonio and other gardens.-*Atropa physaloides* L.

**MANDRAGORA VERNALIS Bert.** Reported by Delicata in 1853 as naturalised since 1833 near Ta-Braxia Cemetery, has entirely disappeared long ago.

### SCROPHULARIACEAE.

Herbaceous plants or woody shrubs, with exstipulate simple leaves, which may be alternate, opposite or whorled. Flowers hermaphrodite, and very generally zygomorphic. Calyx of 4-5 sepals, free or coherent. Corolla hypogynous, gamopetalous, with the tube often gibbose or spurred at the base. Limb more or less irregular, campanulate, rotate, personate, or bilabiate, and then the upper lip is bilobed and the lower trilobed, with an imbricate aestivation. Stamens inserted on the tube, normally 5, but generally reduced to 4 didynamous, or even to 2, the others being wanting or rudimentary. Carpels 2, antero-posterior, forming a 2-celled ovary, rarely one-celled, with many ovules. Style terminal, rarely bifid: stigma often bifid. Fruit

a capsule, rarely a berry. Capsule with 2 coherent valves, bifid or bipartite at the top; dehiscence sometimes poricidal. Seeds many, with a fleshy albumen.

This large family includes 177 genera, and about 2,280 species, spread all over the world, but chiefly in temperate regions and in the mountainous regions of tropical countries.

*Veronica Beccabunga* is considered as antiscorbutic; *V. officinalis* and *Scrophularia aquatica* are used as tonics, astringent and vulnerary. The American *scoparia dulcis* is used as a febrifuge, and the Indian *Herpestes amara* is used in malarial fevers. *Digitalis purpurea* is the classic heart-tonic and diuretic of world-wide use. *Antirrhinum majus* is a diuretic.

### VERBASCUM L.

Herbs more or less tomentose, with large radical leaves, and foliose annual stems. Flowers in terminal or axillary racemes or spikes, solitary or in clusters. Calyx 5-parted. Corolla with very short tube, or without tube, rotate, sometimes concave, with 5-parted limb of nearly equal segments. Stamens 5, inserted on the base of the corolla; filaments unequal. Style linear, stigma dilated or compressed. Capsule bivalved, septicidal, with many small seeds more or less rugose. Species about 160, natives of Europe, North Africa, West Asia and North America.

**VERBASCUM THAPSUS L.** A biennial plant, with an abundant greenish-white tomentum. Stem erect (6-10 diameter), with radical and lower leaves oblong elliptical, almost sessile; middle and upper leaves decurrent. Flowers in clusters, almost sessile, forming thick and dense racemes. Corolla yellow or light-yellow, twice as long as the calyx, with a concave limb; anthers purple. Bracts acuminate, as long as the calyx. Stigma capitate. Capsule oval, subequal to the calyx. (B) Central and South Europe, Asia Minor; naturalised in North America. May-August. An alien; but long naturalised in many gardens and places in *Malta*, as at Attard, San Antonio, Wied Balluta, Corradino etc. Gozo, Marsalforno. E. Great Mullein. I. Taso-Barbasso. M. Xatbet l'andar.

**VERBASCUM SINUATUM L.** A biennial or perennial plant with a thick whitish tomentum. Lower and radical leaves, sinuate-pinnatifid, with a wavy margin, etiolate, oblong-lanceolate, sessile or shortly-petiolate. Flowers fascicled, on short peduncles, arranged in a large, loose, pyramidal panicle, with spreading ascending branches. Calyx with lanceolate segments. Corolla yellow, with a violet throat, rarely white. Capsule as long as the calyx, globose, obtuse (B) or (P) Mediterranean region and Persia. May-August. Frequent and often common in fields and on waste rocky ground, and along country roads, in *Malta*, Gozo and *Comino*-*Verbascum scabrum* Presl.-*V. undulatum* Brenner. E. Mullein. M. Xatbet l'andar. The flowers are much visited by bees.

### CELSIA L.

Herbs more or less tomentose with radical leaves and foliose stems. Flowers in terminal racemes, large and mostly yellow. Corolla with a very short tube or without tube, and deciduous. Stamens 4, didynamous, with hairy filaments, and reniform anthers. Capsule bivalved, with many minute and rugose seeds. Species about 35, natives of the Mediterranean region, Persia, India and Abyssinia.

CELSIA CRETICA L. Plant hirsute or pubescent, somewhat clammy, with a simple erect stem bearing a dense raceme of flowers with long bracts. Lower and radical leaves oval or oblong, entire, lyrate or pinnatifid, or toothed; upper leaves cordate or amplexicaul, toothed or acuminate. Flowers almost sessile. Sepals ovate-oblong. Corolla large, yellow, spotted purple; filaments with violet hairs. Capsule shorter than the calyx, large and globose. (B) Spain, Balearic Islands, South Italy and Sicily, Candia, North Africa. April-June. A native, but rarely met with. *Malta*, at Ghirghenti, Ghain il Gbira, and sporadically in fields and gardens: Gozo, Gnien Imrik, Pergla. M. Xatbet l'andar.

#### LINARIA (Tourn.) L.

Herbaceous plants, erect or prostrate, annual or perennial. Flowers axillary and solitary, or in terminal leafy racemes. Calyx 5-parted, with subequal segments. Corolla personate or bilabiate, with the tube terminating at the base into a prominent conical protuberance or a long spur: with the posterior lip erect and bilobed, and anterior lip spreading and trilobed, embossed or swollen in a manner so as to close the throat, wholly or partly. Stamens 4, didynamous, included: anthers bilocular, with cells divergent at the base and connivent at the apex where the filament is inserted. Style filiform, stigma capitate. Capsule globose or oval, bilocular, with apical dehiscence. Seeds many.-Species about 130, mostly natives of the northern temperate regions of the old world.

LINARIA CYMBALARIA (L.) Mill. Plant perennial, glabrous, of a lively shining green. Stems many, filiform, prostrate, rooting at the nodes. Leaves mostly alternate, with a long petiole, cordate or reniform, 5-lobed, upper surface shining green, lower surface usually purplish. Flowers axillary, solitary, with flower-stalks longer than the leaves. Corolla light violet, with a yellow-palate, rarely white. Capsule globose, reflexed after flowering. (P) Central and Southern Europe. Naturalised in North America. February-May.-*Antirrhinum Cymbalaria* L.-*Cymbalaria Cymbalaria* Wettst. A real native, but rare. Along walks and on shaded walls of gardens and in cool valleys. *Malta*, Wied Babu, Fauuara, St. Julians, Attard, Musta. E. Ivy-Wort, Kenilworth Ivy.

LINARIA ELATINE (L.) Mill. Plant annual, usually prostrate, branched from the base, with long filiform branches mostly simple, all covered with long stellate hairs and short glandular hairs. Leaves heteromorphic; the lower oval or elliptical toothed at the base, the upper hastate, the uppermost much reduced and bract-like. Flowers axillary, solitary, on filiform pedicels much longer than the leaf. Calyx with narrow lanceolate acuminate segments. Corolla with a straight spur, yellow with a violet upper lip. Capsule globose. Seeds rugose. (A) Europe,

North Africa, West Asia, Persia and Abyssinia; naturalised in North America. June-September. *Malta*; frequent in fields after harvest, at Siggieui, Ta Bria, Zebbug, Musta, Boschetto, Hemsia, etc.-*Antirrhinum Elatine* L.-*Elatine hastata* Moench. E. Cancer-Wort, Pointed Toad-Flax. I. Soldino M. Xatbet l'Art.

Var. *Sieberi* Rehb. Plant stronger, usually erect, with a larger corolla, up to 15 mm long, including the spur, and usually more hairy.-L. *Elatine* var. *lasiopoda* Vis.-var. *villosa* Boiss. With the species, but far less frequent.

Var. *Biancae* Lojacono. Plant stronger and usually erect, but with very slender and spreading branches; very pubescent. Corolla about half the length of the preceding. With the species, but rather rare.

*LINARIA SPURIA* (L) Mill. Plant annual, usually prostrate, hairy and glandular. Stem branched from the base. Leaves oval or rounded, the lower almost cordate, entire or sometimes toothed; the upper leaves always entire, much smaller and heavily pubescent. Flower-stalks very hairy and longer than the leaves, axillary and solitary. Calyx with ovate-lanceolate sepals, longer than the capsule. Corolla u.s., large, up to 12-15 mm in length. (A) Europe, Wet Asia, North Africa; naturalised in North America and South Africa. May-September. Frequent in *Malta*, *Gozo* and *Comino*, in fields after the harvest.-*Antirrhinum spurium* L. e. Cancer-Wort, Rounded Toad-Flax. M. Xatbet l'Art.

*LINARIA COMMUTATA* Bernh. In Rehb. Plant perennial, pubescent, branched from the base, with long thin branches. Lower leaves opposed, ovate; the upper leaves alternate and hastate, often with small rounded leaves on the uppermost twigs. Flower-stalks glabrous, just longer than the leaves, axillary and solitary, mostly towards the end of the twigs. Calyx pubescent with lanceolate-linear acute sepals. Corolla large (12-15 mm long), u.s., with a long spur very wide at the base. (P) Mediterranean region. June-September. Along walls of fields, country roads and fields after harvest. *Malta*, Attard, Hemsia, Rabato, Fiddien, etc. rather frequent.-*antirrhinum graccum* Bory.-*Linaria graeca* Chav.-M. Xatbet l'Art.

*LINARIA ARVENSIS* (L) Desf. Plant annual, erect, pubescent and glandular. Sterile stems diffuse and short; fertile or flowering stems erect or ascending. Leaves on sterile stems linear and often whorled in threes. Leaves on fertile stems linear, narrower, alternate. Flowers axillary, with stalks shorter than the calyx, forming a leafy raceme, with linear leaves or bracts, reflexed. Sepals linear-oblong. Corolla small (5-6 mm), violet, veined darket, with a short awl-shaped curved spur. Capsule longer than the calyx. (A) Central and Southern Europe, North Africa, West Asia and Persia. March-May. *Malta*, in fields of sulla and along walls of fields, Zeitun, Asciak, Calcara, Luca; but rather rare.

*LINARIA LAXIFLORA* (W) Desf. Plant annual, glabrous, with flowering stems simple, prostrate or ascending (1-2 diameter). Leaves whorled below, alternate above, small, fleshy, lanceolate; bracts linear-lanceolate. Flowers axillary, solitary, a few at the end of each stem, with a stalk 3 or 5 times as long as the bract, or longer, erect also after fertilization. Corolla pale blue or white. Capsule

as long as the calyx. Seeds minute, rugose, reddish. (A) North Africa.-*Antirrhinum laxiflorum* Willd.

Var. *pseudo-laxiflora* Lojacono. Flower-stalks shorter than in the type, but longer than the bract. Corolla purplish white, with yellowish throat. Capsule shorter than the calyx. Seed u.s. black. Frequent, but nowhere common.-*Linaria reflexa* Delicata non Desf. *Malta*. Valletta Glacis, Delimara, Minsia, Wardia, Bingemma, Melleha, Selmun, Krendi near Wied Hoxt. Gozo, Gran Castello, (a form with pure white flowers-*albiflora* mihi.), Ggantia, Nadur. Also in *Comino* and *Cominotto*.

*LINARIA TRIPHYLLA* (L.) Mill. Plant annual, glabrous, more or less glaucous, erect. Sterile stems few and short. Fertile stems erect and rigid, usually simple (1-3 diameter). Leaves whorled in threes, sessile, ovate or ovate-lanceolate, the lower obtuse, the upper acute. Flowers sessile in a short terminal leafy raceme, dense, interrupted at the base, becoming longer after flowering, with leafy bracts. Sepal oval or oval-lanceolate, obtuse, 3-4 times shorter than the corolla. Corolla erect, almost adpressed, about 2 cm long, whitish, with deep yellow throat, and violet spur, sometimes wholly bluish or violet (form: *caerulea* Chav.-var. *concolor* Guss.) or wholly yellow (form: *flava* Nyman.). Capsule just longer than the calyx; seeds trigonous, rugose. (A) South Europe. February-April. Frequent and sometimes common in fields of sula and in valleys, in *Malta* and *Gozo*. E. Three-leaved Toad-Flax.

*LINARIA CHALEPENSIS* (L.) Mill. Plant annual, glabrous, glaucous, erect (1-2 diameter). Sterile stems few and short: fertile stem single, rarely two or more, simple, rarely branched. Leaves linear-lanceolate, those on the sterile stems and the lower on the fertile stem whorled. Flowers subsessile, in a loose or elongated raceme, pure white. Sepals narrow and acuminate, equal to the corolla. Corolla about 13 mm long, with a long, thin, slightly curved spur much longer than the tube. Capsule globose, half as long as the calyx. Seeds angular, furrowed. (A) South Europe, West Asia as far as Persia. March-May. In fields, and sunny valleys. *Malta*, Boschetto, Wardia, San Martin, Pualet, Ghajn Zhuber, Melleha at Kasam Barrani, ghirghenti, Ghajn il Cbira, Tarxien near Megalithic Temple, Birchircara, Delimara, Wied Encita etc; frequent but not common, generally in single specimens or a few growing in a patch-*Antirrhinum chalepense* L.

*LINARIA MINOR* (L.) Desf. Plant annual, hairy or pubescent and glandular, erect, (1-3 diameter). Stem erect, branched from the base. Lower leaves opposed, oblong-lanceolate; the upper alternate and linear. Flowers axillary, solitary, forming an elongated raceme with many leaves or bracts. Flower-stalk 2 or 3 times as long as the calyx, divaricate. Sepals unequal, linear-oblong, obtuse. Corolla hairy and glandular, slightly longer than the calyx, pale violet with a yellow throat which is not closed, the upper lip being depressed: spur obtuse about half the length of the corolla. Capsule oval, hairy and glandular, shorter than the calyx. (A) Europe, North Africa, Asia Minor. March-May. *Malta*, Wied Babu. First mentioned by Prof. Zerafa, found again by Penza in 1919-*Antirrhinum minus* L.

## ANTIRRHINUM (Tourn.) L.

Herbaceous plants, with lower leaves opposite, and the upper alternate. Flowers axillary, solitary, forming terminal racemes, usually large and showy. Calyx 5-cleft, with nearly equal segments. Corolla large and wide, personate or bilabiate, not spurred, but having a pronounced gibbosity on one side of the base: upper lip bilobed and erect; lower lip spreading, trilobed, with a gibbous palate which closes the throat. Stamens 4, didynamous, included: anthers 2-locular, the cells divergent at the base, connivent at the apex where the filament is inserted. Style hairy and glandular; stigma capitate-bilobed. Capsule, ovate, oblique, 2-locular, many-seeded, dehiscent by 3 pores at the apex. Species about 30, natives chiefly of the northern hemisphere.

**ANTIRRHINUM ORONTIUM L.** An annual plant with an erect stem, more or less branched, hairy and glandular in its upper parts (2-4 diameter). Leaves lanceolate, linear-lanceolate, the uppermost linear, briefly petiolate. Flowers axillary and usually solitary, forming a loose terminal raceme, with flower-stalks shorter than the calyx. Sepals very narrow and linear, much longer than the corolla, which is of a vinous red colour. Capsule oval, pubescent, much shorter than the sepals. (A) Europe, North Africa, West Asia as far as the Himalaya, Abyssinia: naturalised in North America. March-May. Frequent and often common in fields and gardens, and on uncultivated ground in *Malta* and *Gozo*, - *Orontium arvense* Pers e. Lesser snapdragon. I. Gallinella. M. Papocci irkika or Papoc tar-raba.

**ANTIRRHINUM MAJUS L.** A perennial plant with an erect stem, pubescent and glandular in its upper parts (4-8 diameter). Leaves oblong-lanceolate or linear. Flowers large, typically violet-red with yellow throat, axillary and solitary forming a long and somewhat dense raceme, with flower-stalks rather shorter than the calyx. Sepals broadly oval and obtuse, much shorter than the corolla. Capsule oval, pubescent and glandular, having 3 tubercles at the top, equal to or twice as long as the sepals. (P) Central Europe and Mediterranean region; naturalised in North America. January-October. Frequent on rocks, rocky ground, old walls, and along walls of fields in *Malta*, Boschetto, Gneina, Ghain il Cbira, Ghirghenti, Imtahleb, Ghain Tuffieha, Melleha, Selmun, Luca, Krendi, Birzebbugia, Wied Encita, Wied Kirda, Wied il Ghasel etc. Rarer in *Gozo*, Chambray, Xlendi, Imgiar-ix-Xini, Xaghra, Nadur, San Blas, Ghainsielem. *Comino*, near the Hospital, and Kala Santa Maria. E. Large Snapdragon. I. Bocca di leone,, Erba-strega. M. Papocci homor or Ras il Meut.

Var. *tortuosum* Bosc. in Lam. Plant entirely glabrous. Leaves narrower sepals oblong and acute. – *Antirrhinum capitatum* Presl.-A. *romanum* Seb. Et Maur. With the species but rare. *Malta*, fortifications of Valletta, Manoel Island, Boschetto.

**ANTIRRHINUM SICULUM Ucria.** Plant perennial, woody at the base, much branched sometimes hairy and glandular, but more often glabrous. Leaves alternate or opposed or whorled in threes or fours, linear-lanceolate, acute, hairy and glandular. Corolla large, white or light yellow, with yellow throat, smaller than that of the preceding species; racemes shorter and dense. (P) Mediterranean

region. Is in flower all the year. On fortifications, rocks and old wall, and along old walks in gardens. *Malta*, Valletta, Floriana, Birchircara, Attard, Lia, Wied Encita, Boschetto, Ghirghenti, Notabile, St Paul's bay, Wied il Ghasel etc. *Gozo*, rare, at Xlendi, Imgiar ix-Xini, Nadur, Kala, Chambray. *Comino*, Kala Santa Maria.-*antirrhinum angustifolium* Poir.-*A. assurgens* Bianca. M. Ras il Meut, Papocci bojod.

The form: *elongatum* mihi, having long and loose racemes, is frequent on the fortifications of Floriana.

### SCROPHULARIA (Tourn.) L.

Herbaceous plants annual or perennial, with quadrangular stems, opposite leaves and small flowers in loose axillary cymes or terminal panicles. Calyx 5-cleft, with equal sepals. Corolla bilabiate; upper lip bifid, lower trifid, tube short ventricose or oblong. Stamens 4, didynamous. Ovary 2-celled; style filiform, stigma capitate or bilobed. Capsule bivalved, with septicial dehiscence. Species about 120, natives of the temperate regions of the northern hemisphere.

**SCROPHULARIA PEREGRINA L.** An annual glabrous plant, with an erect quadrangular stem, simple or branched. Leaves petiolate, oval or oval-lanceolate, the lower almost cordiform at the base, toothed or serrated. Flowers in axillary and terminal peduncled cymes forming a loose panicle, with flower-stalk 3 or 4 times as long as the calyx. Sepals lanceolate and acute: corolla dark reddish purple, with expanded throat. Capsule subglobose, acuminate. (A) Mediterranean region. March-May. Common in *Malta* and *Gozo* and *Comino*, in fields, gardens, valleys, preferring cooler and shaded localities.-*Scrophularia meridionalis* Presl.

The form with white flowers (f. *albiflora* mihi) is very rare; *Malta*, Wied Encita, Wied il Ghasel. E. Figwort. M. Fisuet il Chelb or Nittiena.

**SCROPHULARIA AQUATICA L.** A perennial glabrous plant, with annual stems and perennial rootstock. Stems erect, rigid, thick, quadrangular, more or less winged along the angles. Leaves with a winged petiole, often with two oval leaflets at the base of the leaf, which is cordiform-oval, crenate or obtusely toothed. Flowers in axillary and terminal cymes, forming a long loose panicle, with many linear bracts. Sepals roundish and scarious. Corolla dark purplish brown, or yellowish brown, u.s. Capsule globose or ovate. (P) Europe, North Africa, West and Central Asia, Mexico. May-October.-*Scrophularia oblongifolia* Lois. e. Water Fig-wort.

Var. *Balbisii* Horn. Stems narrowly winged: leaves without leaflets at the base. A true native, but rare *Malta*, in moist and shaded localities. Gnien il Cbir, Ghain il Cbira, Melleha. Sometimes met with in gardens and on irrigated ground.



## VERONICA (Tourn.) L.

Herbaceous, or sometimes shrubby, plants, with opposed lower leaves and sometimes alternate floral leaves. Flowers axillary and solitary, or in axillary or terminal racemes. Calyx usually 4-5 cleft. Corolla with short tube, with rotate limb 4-5 lobed, deciduous, the inferior lobe being smaller and narrower. Stamens 2, protruded. Ovary bilocular, compressed at the sides; style filiform with obtuse emarginate stigma. Capsule bivalved. Species about 200, natives mostly of the temperate and cool regions of both hemispheres.

**VERONICA BECCABUNGA L.** A herbaceous perennial plant, inhabiting moist places and the margin of ponds and streams, glabrous, with thick hollow round stems, ascending and rooting at the base ( $1\frac{1}{4}$  diameter), often branched and shrubby. Leaves fleshy oval or oval oblong, crenate-serrate or entire, or oval-lanceolate and smaller. Flowers in axillary loose opposed racemes, on pedicels longer than the calyx. Sepals oval-lanceolate, acute. Corolla slightly longer than the calyx, pale blue or pale pink. Capsule as long as the calyx or slightly longer, glabrous and obtuse. (P) Europe, Asia except the tropical regions, North Africa as far as Abyssinia. March-August. *Malta*, at Ghain il Cbira; according to Delicata, but not found again by others. E. Brooklime.

**VERONICA ANAGALLIS L.** An annual, biennial or perennial herb, inhabiting ditches and the margin of ponds and streams, glabrous, or pubescent in its upper parts. Stems ascending or partly decumbent, rooting at the base, hollow, almost quadrangular (1-5 diameter). Leaves not fleshy, opposed, sessile or amplexicaul, rarely petiolate, oblong-lanceolate, entire or toothed. Flowers in opposed axillary racemes. Corolla pale blue, sometimes pale pink, slightly longer than the calyx. Capsule obovate. (A), (B) or (P). Broadly distributed in temperate regions of the northern hemisphere. March-August. *Malta* and *Gozo*, frequent and sometimes common along streams and margins of ponds, as at ghain Mula, ghain Rihana, Wied Kannotta, Gneina, Wied il Lunziata near Fauuara etc. e. Water-Speedwell. l. Erba grassa.

**VERONICA ARVENSIS L.** An annual plant, erect, ascending or decumbent, pubescent (1-2 diameter). Leaves opposed, entire, crenulate or toothed, the lower petiolate and oval, the upper sessile oval-lanceolate and cordate at the base. Flowers most sessile, in terminal racemes, dense at flowering and afterwards loose. Sepals hairy and glandular, longer than the capsule, very unequal, linear. Corolla small, with a very short tube, pale blue or white, shorter than the calyx. Capsule very compressed laterally, obcordate. (A) Europe, North Africa, Asia as far as Siberia; naturalised in North America. February-April. *Malta*, in gardens, on old walls, and in uncultivated places, rather frequent. San Antonio, Rabato, Boschetto, Tarxien etc. E. Wall Speedwell

**VERONICA AGRESTIS L.** Plant annual, more or less pubescent. Stem branched from the base, weak and prostrate or decumbent (1-3 diameter). Leaves of a lively green, opposed, with a short petiole, oval-cordate, or oval,

deeply toothed. Flowers solitary and axillary, with flower-stalks hardly longer than the leaves. Sepals oval-lanceolate, usually obtuse, sometimes subacute. Corolla 4mm wide, pale blue, with the lower lobe white. Capsule bilobed, keeled along the margin, with a very short style, containing 4-5 seeds. (A) Distributed like the preceding species. January-April. *Malta*, frequent in gardens, shaded places, country roads etc.-*Veronica pulchella* Guss.-*V. agrestis* a. *Linneana* Vis.

VERONICA DIDYMA Ten. Plant and stems u.s. Leaves u.s., large and deep green. Flowers u.s. Sepals ovate and generally acute, with prominent nerves, and overlapping each other in the fruit. Corolla entirely deep blue, about 7 mm wide. Capsule with divergent lobes, not keeled; style extending beyond the lobes. Seeds 8-10 (A) Same distribution as above. *Malta*, with the preceding, but rarer. San Antonio, Boschetto, Ghain il Cbira, and in gardens at Attard, Lia, Birchircara.-*Veronica agrestis* b. *Tenoreana* Vis.-*V. polita* Fr.

VERONICA HEDERAEFOLIA L. Plant, stems, and leaves u.s. Leaves of lighter green or pale green; plant more hairy. Flowers u.s., with flower-stalk longer than the leaf, and becoming reflexed and elongated after flowering. Sepals cordiform at the base, and ciliated. Corolla shorter than the calyx, white, or very pale blue, 3 mm wide. Capsule shorter than the calyx, 4-lobed or 2-lobed, with 1 or 2 large seeds. (A) Mediterranean region. December-March. *Malta*, on old walls, in rocky valleys, and garden walks. Frequent, but not common: at Attard, Misida, Wied il ghasel, Wied Kirda, Notabile, Pieta etc.

VERONICA CYMBALARIA Bodard. Plant and stems u.s. pubescent, or rarely almost glabrous. Leaves somewhat fleshy, cordate or rounded at the base, with 5-7 teeth or lobes, or even 3-5 teeth but larger; or sometimes almost entire. Flower-stalks longer than the leaves, becoming reflexed and elongated after flowering. Sepals elliptical, obtuse, spreading out after flowering. Corolla white or very pale blue, about 3 mm wide. Capsule hirsute, globose, as long as the calyx, with 1-2 seeds. (A) Mediterranean region. December-May. Frequent on old walls, on rocky ground and on heaps of rubbish and stones, in *Malta* and *Gozo*.

Var. *panormitana* Tin. in Guss. Upper leaves truncated or cuneate at the base. Plant less hirsute and weaker. Corolla smaller. Capsule glabrous. With the typical form, and almost as frequent.

## BARTSIA L.

Herbaceous plants, usually half-parasitical on the roots of the other plants, with erect stem, opposite leaves, and terminal racemes of yellow, purplish or whitish flowers. Calyx tubular or campanulate, 4 toothed or 4-fid. Corolla bilabiate, with a long tube, with the upper lip galeate and entire, the lower lip trilobed. Stamens 4, didynamous, each with two cells divergent and acuminate at the base. Capsule oval, longer than the calyx, acuminate,

bilocular, loculicidal. Seeds many and minute. Species about 34, natives of Europe, America, North Africa as far as Abyssinia.

**BARTSIA TRIXAGO L.** An annual plant, with an erect and rigid stem, usually simple (1-5 diameter), pubescent and scabrous. Leaves opposed, sessile, the lower oblong-lanceolate the upper linear-lanceolate, deeply toothed, hairy and glandular. Flowers in a short and dense terminal raceme, hairy and clammy, the lower bracts as long as the flowers or longer, the upper shorter. Segments of calyx oval, obtuse. Corolla with lower lip trifid and longer than the upper, usually white flushed yellow and purple (form: *versicolor* Willd.), sometimes pure white (form: *albiflora* mihi), rarely yellow (form. *Lutea* Wk, et Lge). Capsule globose, villose, hardly longer than the calyx. (A) Mediterranean region, Abyssinia, South Africa, South America and the Canaries. April-May. Frequent on uncultivated ground and in exposed situation in *Malta* and *Gozo*, and especially in *Comino*. *Beliardia Trixago* All.-*Trixago apula* Stev. E. Cow-wheat, Viscid Eye-bright.

**BARTSIA VISCOSA L.** An annual plant, very hairy and clammy, with an erect stem, rigid, and often branched above, (1-4 diameter). Leaves sessile, the lower oval-oblong, the upper oval-lanceolate, deeply toothed, very hairy and clammy. Flowers in long terminal racemes, interrupted below, with toothed bracts at first longer and then shorter than the flowers. Calyx with lanceolate or linear segments, entire or toothed. Corolla yellow, twice as long as the calyx, with the lower lip longer than the upper. Anthers hairy. Capsule elliptical and acute, a little longer than the calyx, hairy only at the top. Seeds many, minute, (A) West and South Europe, West Asia as far as Persia, Canaries, Madeira April-May. *Malta*, frequent in many localities; partly parasitic on the roots of various plants. Wied Encita, Luca, Corradino, Wied Babu, Ta Baldu, etc. *Gozo*, Ghainsielem, Imgiar ix-Xini.-*Trixago viscosa* Rehb.-*Euphrasia viscosa* Benth. in D.C.

## OROBANCHACEAE.

Herbs, annual or perennial, parasitic on the roots of other plants, and devoid of chlorophyll, with a thick and fleshy stem, more or less covered with alternate or imbricate scales, replacing the leaves. Flowers zygomorphic, hermaphrodite, usually solitary in the axils of the upper scales, and usually sessile forming a spike or rarely a raceme. Calyx 4-5-cleft. Corolla monopetalous and hypogynous, persistent, 2-lipped; the upper lip usually hooded, entire or bifid; the lower 3-fid or 3-toothed, with an imbricate aestivation. Stamens 4, didynamous, inserted on the tube. Ovary inserted on an annular fleshy disk, 1-celled with parietal placentation, and with many ovules. Style simple, usually curved at the tip. Capsule 1-celled, bivalvate. Seeds minute, with a minute embryo in a transparent albumen.

The family includes 12 genera and about 150 species natives mostly of the temperate regions of the world.

The Orobanchaceae are notorious parasites, often very injurious to crops. Some of them were injurious to crops. Some of them were formerly used in medicine, but have fallen into disuse.

#### KOPSIA Dum.

Flowers in a spike, subsessile, the upper sessile, having at the base one bract, and two lateral bracteoles one on each side. Calyx tubular or campanulate, 4-toothed, rarely with a fifth, smaller, posterior tooth. Corolla bilabiate, usually with a hairy limb, the upper lip 2-cleft, the lower 3-cleft. Stamens 4 didynamous, included, inserted on the tube of the corolla. Stigma bilobed or funnel-shaped. Capsule one-celled, with 2 valves which remain coherent at the base and apex. Seeds many, minute, globose. Species 20, natives of Europe, West Asia, North Africa, as far as Abyssinia, South Africa, East Indies. This is rather a subgenus of *Orobanche* than a distinct genus.

**KOPSIA RAMOSA (L.) Dum.** Plant with short pubescence and glandular, stem 3-40 cm high generally with one or more branches, sparsely furnished with small and oval scales. Bracts and bracteoles equal to the calyx, rarely shorter. Spike loose and many-flowered. Teeth of calyx triangular-acuminate shorter than the tube, not reaching beyond the constriction of the tube of the corolla. Corolla up to 17 mm long; upper lip bilobed, lower lip with 3 subequal lobes, all lobes roundish and obtuse, entire or undulant, rarely toothed or ciliated. Stamens glabrous or hairy at the base; anthers acuminate (A) Europe, Egypt, Abyssinia; naturalised in North America, East Indies and South Africa. April-May. Parasitic chiefly on species of *Trigonella* and *Vicia*, less frequently on *Hedysarum* and *Scorpiurus*. *Malta*, at Attard, Wied Encita, Boschetto, and probably elsewhere. The form: *polyclonos* (Wallr.) Beg. Has a branched flower-scape, which is simple or almost simple in the form: *monoclonos* (Wallr.) Beg. The corolla which is violet-blue, is deep-blue in the form: *cyanea* Beg., or rarely white in the form: *albiflora* (Gr. Et Godr.) Beg.

**KOPSIA MUTELI (F Schultz.) Beg.** Flower-scape generally branched from the base and slender, nodose at the base, and club-shaped 9-25 cm high, sparsely furnished with obtuse bracts. Bracteoles lanceolate and longer than the tube of the calyx. Calyx with 4-5 teeth, lanceolate-acuminate, equal to the tube, reaching beyond the constriction of the tube of the corolla. Corolla hairy and glandular, 200 mm long, dilated at the throat, with roundish lobes, crenated or undulant, with deep folds. Stamens thickened at the base, glabrous or slightly hairy. Capsule subequal to the calyx. Spike long and dense, sometimes slightly interrupted below; flowers deep amethyst blue; but often cream-coloured slightly suffused bluish, with a deep yellow throat (form: *panormitana* Lojacono. (A) Mediterranean region, as far as India and Abyssinia; naturalised in South Africa. March-May. Common or very common in *Malta*, *Gozo* and *Comino*, on the roots of many plants, including Leguminose plants. *Oxalis cernua* etc.-*Orobanche Muteli* Schultz.-*Phelipaea Mutell* Reut. in D.C..

Var. *angustiflora* (Beck) Beg. Spike shorter and more interrupted; and ally less dense. Corolla smaller, more markedly constricted, and less

dilated at the throat.-*Phelipaea Reuteri* E et A Huet. With the species but far less common.

Var. *melitensis* (Beck.) Sommier et Caruana-Gatto. Flower-scape slender, waxy or light yellow. Spike rounded at the top. Teeth of calyx acuminate and longer than the tube. Corolla smaller, more markedly constricted than in the typical form., white or pale yellow, tube canary yellow, hardly ever very slightly suffused blue. Stigma white. Very common in *Malta*, *Gozo* and *Comino*, especially in very arid localities, with a low vegetation of *Oxalis cernua*.-*Orobanche Muteli* var. *melitensis* Beck.

**KOPSIA LAVANDULACEA** (Rebh.) Caruel. Plant hairy and glandular. 2-6 diameter high; flower-scape usually branched, slender and rigid, well-covered with scales at the base. Spike long, cylindrical, dense above, interrupted below. Bracts pubescent or hairy, oval-lanceolate, as long as the calyx; bracteoles awn-like, and shorter. Calyx 4-5 toothed, with triangular-acuminate teeth, divergent, equal to the tube, and extending beyond the middle of the corolla. Corolla very narrow and white below, becoming dilated at the throat and of an intense blue, with roundish obtuse lobes, crenulate margin, with deep folds covered with white or yellow hairs. Anthers ciliated and glandular. Capsule longer than the tube of the calyx, slightly pointed at the apex. (A) Mediterranean region and the Canaries. April-May. On the roots of various plants, especially of *Psoralea bituminosa*, being particularly fine close to the sea-shore. Frequent but not common. *Malta*, St. Paul's Bay, Bugibba, Saline, Melleha, Imtahleb, Gneina, Wied Encita, Boschetto, Dingli. *Gozo*, Xlendi, Imgiar ix-Xini, Pergla-*Orobanche lavandulacea* Rehb.- *O. caerulea* b. *ramosa* Presl-*Phelipaea lavandulacea* Reuter.

**KOPSIA SCHULTZII** (Mutel) Beg. Plant hairy and glandular (1-6 diameter); flower-scape usually branched and slender, very tender, well furnished with scales, which are ovate-acuminate and often slightly toothed at the base, the upper scales being ovate-lanceolate and applied to the scape. Bracts lanceolate equal to the segments of the calyx, the bracteoles being narrower and shorter. Flowers subsessile or furnished with a short peduncle. Calyx obliquely campanulate, very hairy and glandular, with linear segments longer than the tube and almost equal to the tube of the corolla. Corolla slightly reflexed, lobes ovate or elliptical, obtuse, with a dilated throat, blue, paler lower down the tube. Anthers acuminate, hairy except at the base. Spike dense and pyramidal, somewhat interrupted below. (A) Mediterranean region and Abyssinia. March-May. Rare; on the roots of *Inula viscosa*, *Vicia Faba*, various *Galii* etc. *Malta*, Wied Balluta, Mghatab.-*Orobanche Schultzii* Mutel.-*O. caesia* Guss.

### OROBANCHE (Tourn.) L.

Flowers in simple spikes, though the flower-scapes may be several arising from the same rootstock. Flowers usually sessile in the axil of a bract, without bracteoles. Calyx made of 2 distinct parts, disposed laterally, sometimes connate anteriorly, rarely connate also posteriorly, each part being 2-toothed or 2-cleft. The rest as in *Kopsia*. Species about 90, natives of the temperate

and warm regions of the northern hemisphere, 1 being native of Chili and Australia, and 2 naturalised in south Africa.

**OROBANCHE CERNUA** Loefl. Flowers-scape stout, rarely slender, woolly and glandular, rarely almost smooth, up to 4 diameter high; furnished with ovate or ovate-acuminate scales, often somewhat toothed at the margin, woolly and glandular. Spike dense, cylindrical, rounded at the apex. Bracts oval; calyx with free segments, sometimes partly coherent in front or behind, much shorter than the tube of the corolla, oval-lanceolate, entire or with 2 acuminate teeth. Corolla dilated below the insertion of the stamens, curved and reflexed for the upper two-thirds, of an amethyst blue. Stamens glabrous or a little hairy at the base and at the suture of the anthers. Stigma whitish. Capsule to the calyx or longer. (A) Mediterranean region, India, Australia. April-May. Parasite on the roots of Compositae and solanaceae. *Malta*, rare, at Marfa, Melleha, Boschetto: occasionally frequent in gardens on the roots of *Chrysanthemum frutescens* at Sa Maison Gardens etc. *Gozo*, also rare, at Marsalforno.-*orobanche cumana* Guss. non Wallr.-*O. bicolor* Bert. Non Mey.-*O. hispanica* Boiss.-*O. gallica* Gren.

**OROBANCHE CARYOPHYLLACEA** Sm. Flower-scape 4-6 diameter high, stout, pale violet, glandular and hairy, sometimes subglabrous, furnished with oblong-lanceolate scales. Spike short, loose or sense. Divisions of calyx free, or partly connate in front, with acuminate teeth about half as long as the corolla. Corolla 17-35 mm long, purplish or lilac with purple stigma, or pale yellow with yellow stigma (form: *strobiligena* Rehb), concave at the back, with the upper lip erect and generally apiculate. Stamens hairy for their lower half, and at their insertion on the anthers. (P) Central and Southern Europe. April-May. Parasitic on roots of Leguminose plants. Must be very rare. *Malta*, San Antonio Gardens, according to Gulia (in litteris); also according to Delicata without locality.-*orobanche Galii* Duby, (Gulia, in litteris).

**OROBANCHE SANGUINEA** Presl. Flower-scape slender, 10-45 cm high, usually yellow, sometimes reddish or purplish, well furnished with oval-lanceolate scales below, and with narrower scales above, very hairy and glandular. Divisions of calyx partly connate in front, and deeply 2-cleft, with awl-shaped teeth, shorter than the tube of the corolla. Corolla yellow at the base, red or dark purple in the tube and limb, rarely entirely yellow. Stamens glabrous, or slightly hairy above and below. Spike very dense, with densely hairy bracts subequal to the flowers. (A) South Europe and Algeria. April-May.

Var. *crinita* Viv. Bracts only slightly hairy, equal to or a little longer than the flowers. Spike very dense and acuminate. *Malta*, very rare, at Marfa and Melleha, on uncultivated land; parasitic on the roots of Leguminose plants.

**OROBANCHE DENSIFLORA** Salzm. Flower-scape solitary, thick, stiff short, dirty-yellow and hairy, 1-2 diameter high, its upper two-thirds consisting of a dense spike of sessile flowers 1 to 1½cm long, of a pale yellow colour, hairy and glandular. Bracts brownish, shorter than the flowers, lanceolate-acuminate, scabrous. (A) March-May. Southern Spain and Morocco.

Form: *melitensis* Beck in litt. Divisions of calyx connate, corolla subglabrous and subglandular. Entire plant pale yellow. *Malta*, very rare, at Marfa on the sandy beach, between Ghadira and the sea, on the roots of *Lotus pusillus*. Was collected in 1895 and 1907, and was very numerous in 1925.

**OROBANCHE CRENATA** Forsk. Flower-scape stout, hairy and glandular, yellowish-white, or bluish or rarely purplish, densely furnished with lanceolate scales at the base, but sparsely above, 3-7 diameter high. Spike cylindrical, usually with many flowers, dense above, more loose and interrupted below. Bracts narrowly lanceolate and acuminate, equal to the flowers or longer. Divisions of calyx narrow and acuminate or awl-shaped, sometimes lanceolate and furnished with 1-3 teeth, of varying length. Corolla large, 15-30 mm long, whitish or flesh-coloured, veined pink or violet, with large spreading lobes. Stigma violet or light pink. (A) Mediterranean region, as far as the Caucasus and Persia; naturalised elsewhere. February-June. Very common in *Malta*, *Gozo* and *Comino*, on Leguminose plants, being very injurious to crops of broad beans (*Vicia Faba*), of peas (*Pisum sativum*) and also of *Vicia nebrodensis*. It attacks also other Leguminose plants, both wild and cultivated, and a pigmy form, not more than 4 diameter high is frequent on cultivated *Pelargonium zonale*.-*Orobanche speciosa* D.C. non Dietr.-*O. pruinosa* Lap- *O. segetum* Sprun.-*O. alba* Mutel non Steph. E. Broom-rape. I. *Brucialegumi*, *Lupa*. M. *Budebbus*.

**OROBANCHE LORICATA** Rebh. Flower-scape dark yellow or purplish, rather slender, hairy and glandular or almost glabrous, 1-7 diameter high, furnished with oblong acuminate scales, often very hairy. Bracts longer than the flowers. Corolla erect or divergent, not curved, 15-20 mm long, yellowish-white, with violet nerves, glandular and hairy on the outside, with crenate and undulant lobes, glabrous along the margin. Stamens very hairy above, less hairy at their insertion a little above the base of the corolla. Stigma purplish. (P) Central and Southern Europe. April-May.

Var. *Picridis* Schultz. Bracts shorter than the flowers. Stamens glabrous above, or only slightly hairy. *Orobanche Artemisiae* Vauch. *Malta*, not uncommon on the roots *Vicia cuneata*, *Galactites tomentosa*, *Daucus Carota* etc. Frequent also in *Gozo* and *Comino*. The local plants belong to the form *Carotae* Desmoulins.-*Orobanche ambigua* Moris., in which the corolla become violet on drying.

**OROBANCHE BARBATA** Poir. Flower-scape rather slender, hairy and glandular, 1-5 diameter high, furnished with bracts, oblong below, lanceolate above. Spike cylindrical, dense or loose. Bracts about as long as the corolla. Divisions of calyx free acuminate or lesiniform, about as long as the corolla. Corolla about 15 mm long, hairy and glandular on the outside, yellowish white, with violet nerves on the limb. Stamens inserted a little above the base of the corolla. (A) Central and Southern Europe, Abyssinia; naturalised in North America. March-April. Rather rare in *Malta*, more frequent in *Gozo*, as at Ta Cenc, Imgiar ix-Xini, Sannat, Xlendi and Xaghra. Parasitic on the roots of

vari

-O.

-scape 1.5 diameter high, yellowish or reddish, very hairy and glandular, with oblong scales, almost above, hairy, erect and spreading. Spike cylindrical, rounded at the top, dense or loose. Bracts narrowly lanceolate, as about as long as the tube of the corolla, sometimes connate. Corolla -20 mm long, at first erect and afterwards the base of the corolla, intensely hairy for their lower half. Stigma dark violet or mauve. -May. Parasitic on the

*Malta*,  
Gozo, at Imgiar

ix- *Comino*. The v deep mauve or purple, self-  
*Chrysanthemum frutescens*, *C. capillaceum* and on *Inula crithmoides* at Floriana.

OROBANCHE HEDERAE Vauch. Ex Duby. Flower scape pale yellow or reddish, or loose spike. Segments of calyx entire or bifid, very acute or almost filiform. Corolla whitish or yellowish, suffused violet above, 1 to 2 cm long, glabrous, imb. Stamens inserted a little above the base of the corolla, and hairy near their insertion. (A) March June. Western and Southern Europe, Asia Minor, Algeria. Parasitic on the roots of the Ivy *Malta*, common in the ditches of Valletta a Addolorata and Ta Braxia Cemeteries, San Antonio, Boschetto, Ta Baldu etc. Gozo -Helicis F. Schultz O. Vaucheri Noulet O. Helicis Rota.

OROBANCHE CANESCENS J. et C. Presl. Flower- -10 ameter), yellowish or yellowish brown, glandular, covered with long white hairs, sparsely furnished with scales. Lower scales oval and glabrous, the at the top where it is dense, but loose below. Bracts oval lanceolate, as long as the corolla or longer, thickly covered with white hairs. Divisions of calyx or less hairy and reddish externally, yellowish white or yellow internally. and glabrous above. Stigma yellow. (A) South Italy, Sardinia, Sicily and Greece. March May. *Malta* elicata on the roots of *Chrysanthemum coronarium* in the old Cemeteries at Floriana *Orobanche australis* Moris.-

and Southern Spain, was collected in single specimens at St Paul's Bay, but



Species of *Kopsia* and *Orobanche* are called Broom-rape in English, *Brucialegumi*, or *Bruciafave*, or *Lupa* in Italian, and *Budebbus* in Maltese.

## ACANTHACEAE.

Plants woody, or woody at the base, with jointed stems and branches, with swollen nodes. Leaves mostly simple, opposed or whorled, exstipulate. Flowers hermaphrodite, zygomorphic, axillary or terminal, in spikes, racemes or clusters, rarely solitary, furnished with a bract and 2 bracteoles, these last being large when the calyx is much reduced. Calyx of 5 segments, sometimes much reduced or obsolescent. Corollagamopetalous, zygomorphic, tubular, hypogynous, usually bilabiate, with the upper lip bifid or reduced, and the lower trilobed, with imbricate aestivation. Stamens inserted on the tube of the corolla, 4 didynamous, the fifth or posterior stamen being rudimentary or wanting, sometimes reduced to 2; with filiform or subulate filaments. Ovary superior, 2-celled, with a double septum, each cell with 2 or more ovules; with a terminal simple filiform style, stigma usually bifid. Fruit a 2-celled and 2-valved capsule, sessile or almost stipitate. Seeds round or compressed, generally accompanied by subulate or hooked processes of the septum. Embryo exalbuminous, campylotropous.

The family is a large one, comprising 175 genera and about 1,350 species, broadly distributed in warm regions of both hemispheres. The *Acanthaceae* are mostly of ornamental value, but *Justicia paniculata* is used as a strongly bitter tonic, and other species are used in the tropics as febrifuges. Our native *Acanthus* is sometimes used as an emollient for poultices.

### ACANTHUS (Tourn.) L.

Flowers in a terminal spike, each inserted in the axil of a large bract, with a bracteole on each side. Calyx 4-parted, with unequal segments. Corolla with very short tube, its lower half prolonged into a trilobed lip. Stamens 4, almost didynamous, the lower 2 with the filament curved at the apex. Anthers 1-celled, ciliated along the commissure. Stigma trifid, with one lobe much shorter than the others. Capsule membranous, loculicidal, having in each cell two oval compressed and tubercled seeds. Includes about 20 species natives mostly of tropical and subtropical regions of the eastern hemisphere.

**ACANTHUS SPINOSUS L.** Plant with perennial root-stock and annual stems. Leaves pinnatifid or pinnate, with pinnatifid or toothed and mucronate and spinous lobes. Stem erect, simple, glabrous or slightly pubescent, usually of a violet colour, 4-9 diameter high. Flowers in a long dense spike. Bracts oval-lanceolate, spreading, terminating in a long spine. (P) Italy, Dalmatia, Corsica, Greece, Crete, Rhodes and Asia Minor. April-June.

Var. *spinulosus* Host. Leaves with acute-lanceolate segments, mucronate and briefly spinous. Bracteoles linear-lanceolate, flat, acuminate, hairy, and terminating in a spine. Calyx glabrous and violet. Corolla white with violet

*Malta*, rare, at Bubakra, according to Delicata;  
again by others. M. Brancorsina xeuechia.

ACANTHUS MOLLIS L. Plant u.s. Leaves pinnatifid, sinuate, or lyrate-  
entirely spineless, soft, up to 50 cm long. Flowers sessile, inserted on long  
-10 diameter high, dense or interrupted below, with oval oblong  
bracts, white below, shaded violet above, as long as the calyx, toothed and

upper lobe oval- -shaped, 3 toothed at the apex and covering  
the stamens. Corolla of same colour as above, with lower lobe obovate 3  
lobed, much narrowed in its lower half. Capsule ovoid, glabrous. (P) Western  
Mediterranean region. March June. Frequent and often common in shaded

Carob- *Malta*, Gozo and . E. Acanthus. I. Acanto,  
Brancorsina. M. Hanneuija, Brancorsina.

The form: albiflorus mihi, having light gr  
flowers, is rare. *Malta*

-Justicia Adhatoda. L. native of Ceylon, Jacobinia

Jacobinia Pohliana Benth. Et Hook Cytranthera Pohliana Nees. Native of  
Brazil, are frequently found in neglected corners in old gardens, but are not

opposite. Flowers small in a bracteate spike on an axillary peduncle, usually  
with as many teeth as there are stamens. Stamens four, rarely reduced to  
one, hypogynous or inserted on the coroll -4 celled, with peltate  
-seeded bony nutlet. Seeds peltate. Embryo

temperate regions.

The leaves of Plantago major are bitter and slightly astringent, and are often  
contain abundant mucilage in their testa, and are used as laxatives, and in  
infusion also as emollients in ophthalmia.  
sometimes used as salad.

Flowers actinomorphic, hermaphrodite, in the axil of a bract, forming cylindrical, oval, or globose dense spikes. Calyx 4-cleft, the two anterior segments sometimes connivent. Corolla small, persistent, membranous, 4-cleft, with segments reflexed when in bloom. Stamens 4, with long and slender filaments, inserted at the lower end of the corolla. Anthers bilocular, with longitudinal dehiscence. Capsule membranous, oval, surrounded by the remains of the calyx and corolla, with 2-4 cells, with transverse dehiscence (pyxidium) having 1-4 seeds in each cell. Seeds boat-shaped or peltate. Includes about 190 species, natives mostly of temperate regions.

**PLANTAGO MAJOR L.** Plant perennial, with large, radical, broadly oval elliptical leaves, obtuse or acute, with a long petiole, dilated at the base, with 3-5 longitudinal nerves, glabrous or slightly pubescent, often ciliated along the margin near their base, with margin entire or slightly toothed. Flower-stems as long as the leaves, erect or ascending, somewhat hairy, up to 30 cm long, bearing a cylindrical spike, about 15 cm long, dense, or somewhat interrupted at the base. Bracts broadly oval, glabrous or slightly hairy. Calyx with oval, obtuse lobes: corolla with obtuse lobes: stamens whitish (P) Almost cosmopolitan. March-November. *Malta*, at Wied Gherzuma, Imtahleb, Bahria, Gneina, Ghirghenti, Boschetto, Gnien il Cbir, Gnien Ingrau, San Antonio, etc, usually in moist or shaded localities. *Gozo*, at Xlendi, Wied il Lunziata, Imgiar-ix-Xini, Nadur. E. Greater Plantain. I. Piantaggine, Cinquenervi. M. Bizbula.

Var. *paludosa* Ledeb. Plant small; leaves with long petiole, glabrous. Flower-spike smaller and more interrupted. Lobes of corolla acute; stamens reddish. With the species at San Antonio Gardens, Wardia, Bahria and Xlendi.

**PLANTAGO LANCEOLATA L.** Plant perennial. Leaves lanceolate, rather obtuse, glabrous or very slightly hairy, radical or on a very short stem. Flower-stems erect or ascending, much longer than the leaves, glabrous or with applied hairs, furrowed. Spike cylindrical, or sometimes reduced and almost globose, rarely branched when growing on rich soil. Bracts membranous-scarious, broadly oval, almost black and hairy. Lobes of calyx broad and membranous. Lobes of corolla oval-acuminate reddish or brown, rarely white. Stamens white or violet, anthers yellow or white. (P) Europe, Asia, North Africa; naturalised elsewhere. March-May. *Malta*, on the Glacis at Pieta, Imtahleb, Fiddien, Boschetto, Bahria, Gneina, etc. *Gozo*, at Wied il Lunziata. E. Ribgrass Plantain I. Lanciuola, Mestelaccio, Arnoglossa. M. Bizbula salvagga.

**PLANTAGO LAGOPUS L.** Plant perennial, usually with rosulate leaves, lanceolate, with long petiole, entire, or slightly toothed, more or less hairy especially on the lower surface. Flower-stems erect or ascending, usually longer than the leaves, glabrous or with applied hairs. Spike ovate, or oblong, or somewhat cylindrical, globose in dry localities, more or less woolly, with hairs covering and hiding the bracts. Bracts lanceolate scarious, with a black line in the middle, with long white or yellowish hair on their upper half. Lobes of calyx keeled, very hairy at the tip. Lobes of corolla oval-acuminate and spreading. (P) Mediterranean region, Canaries, Madeira. March-May. *Malta*,

and *Cominotto*

uncultivated land, rocky wastes, and along roads. The form: *caulescens* Guss., with

at Floriana, Boschetto, Dingli, Wied Encita etc.-

leaves lanceolate, nerves. Flower- s, entire or slightly toothed, with 3- -10 cm long, usually -3 cm long, dense or Lobes of calyx scarious, the posterior lobes being abruptly acuminate. Lobes of corolla

reddish yellow. (A) Mediterranean region as far as Persia. March- *Malta*, in arid and Ciaghak, Pembroke Camp, Marfa etc. , at Ta Cenc, Nadur, Xaghra, Ghainsielem, *Plantago pilosa* Pourr.

**PLANTAGO ALBICANS L.** Plant perennial, with a branched rhizome, and woody stems, sometimes slightly linear-silky tomentum on both surfaces. Flower-tomentose, longer than the leaves. Spike cylindrical, rather long, loose, hairy, -lanceolate concave, hairy at the tip.

obtuse. Seeds oval and shining (A) Mediterranean region, Syria and Persia. May -May. , not common; St Paul's Bay along Xemxia road, Glacis of Floriana along road to Gas Works. , Gran Castello and neighbourhood.

The form: *latifolia* Wk et Lge. With broader leaves and shorter petiole, and the form: *angustifolia* Guss, with more acuminate and whiter, are both found on the Glacis at Floriana.

**PLANTAGO CORONOPUS L.** Plant annual or perennial, with radical rosulate leaves. Leaves only slightly fleshy, pinnatifid or pinnatilobed, entire, with lobes toothed or entire, hairy or almost glabrous. Flower-prostrate or ascending, 3- - cm long, not furrowed. Spike slender, cylindrical

margin. Posterior lobes of calyx keeled and winged. Lobes of corolla oval

or without a membranous wing along the margin. (A), (B) or (P) Europe, North Africa, Persia. March October.

*Selmun*, very common on uncultivated ground, along country roads, in rocky -*Plantago neglecta* Guss. E. Buck's horn Plantain. Star of e Gouan with leaves having a broad midrib, and the limb divided into short lanceolate

more fleshy leaves, having the midrib broad at the tip and pinnate oval-lanceolate segments, more common.

Var. *commutata* Guss. Leaves linear, usually deeply toothed or pinnatifid. Flower-stems short and thick about as long as the leaves. Spikes as long as the flower-stem; bracts acute but not acuminate. Very common in *Malta*, *Gozo*, and *Cominotto*, especially in arid localities.

Var. *pusilla* Moris-Plantago Weldenii Rchb.-P. *filiformis* C. Koch. Plant small, with linear and narrow leaves, only slightly toothed, usually annual. Flower-stem very short, spike short; bracts acute; leaves somewhat fleshy. In the form: *microcephala* Sommer, the spike is almost globose and reduced to a few flowers. Very common on dry waste lands.

Var. *bombycina* (Decaisne) Sommer. Plant very small, annual, with fleshy linear slightly toothed or entire leaves. Flower-scapes very short and thick, decumbent or often prostrate.-P. *Coronopus* var. *crassipes* Cosson et Daveau.-P. *cryptoides* Beg. Common on arid ground, especially in *Comino*.

Var. *macrorhiza* Poir. Plant perennial, with a thick woody rootstock, glabrous; with linear leaves having mucronate teeth or lobes. Flower-stems pubescent, as long as the leaves or longer. Bracts acuminate, longer than the calyx; spike at first ovoid, afterwards elongated. *Malta* and *Gozo*; rather rare, along country roads and in valleys.

Var. *ceratophylla* Lk. Plant annual or biennial, but not with woody rootstock, hairy or hispid. Leaves u.s. Spike villous; bracts more acuminate. *Malta* and *Gozo*; not common, usually in arid localities and seaside places, as at Marfa, Saline, Bahar ic-Ciaghak Xlendi, Imgiar ix-Xini etc.

PLANTAGO SERRARIA L. Plant perennial, glabrous or pubescent. Leaves radical, rosulate, lanceolate, acute or acuminate, with a long or short petiole, often almost sessile, with serrated margin. Flower-stems ascending or erect, 3-20 cm long, smooth, as long as the leaves or longer. Spikes cylindrical, slender, usually interrupted at the base, with oval bracts obtuse or slightly acute, membranous along the margin, often purplish at the tip. Lobes of calyx oblong, obtuse. Lobes of corolla oval, and usually acuminate. (P) South Europe and North Africa. March-May. *Malta*, *Gozo* and *Comino*; common on uncultivated ground, in valleys, along country roads etc. M Salib l'art. Often used as salad. The form: *hybrida* Ten. with leaves almost erect and longer and denser spikes, is frequent in valleys and shaded situations.

PLANTAGO PSYLLIUM L. An annual plant with an erect or ascending stem, simple or branched, fistulose, pubescent and glandular. Leaves opposed, linear or linear-lanceolate, somewhat fleshy, pointed at both end, spreading or recurved, usually entire, ciliated at the base. Flower-stems axillary and opposed, shorter than the leaves; spike globose or oval, with few flowers. Bracts lanceolate, about as long as the flowers. Lobes of calyx equal, lanceolate. Lobes of corolla linear-lanceolate acute. Capsule oblong, bilocular, with a large reddish, shining, boat-shaped seed in each cell. (A) Mediterranean region as far as Persia and Abyssinia. February-May. *Malta*, *Gozo*, *Comino* and *Cominotto*, common on cultivated and uncultivated ground, on rocky wastes, along roads etc.

The form: *sicula* Presl. With hairy viscid stems and toothed leaves in vigorous is met with in gardens and on good soil; the form: *divaricata* Zuccagni, with spreading branches, is also found in exposed situations but always on il brieghet.

TA Schousb. Plant annual, erect or ascending, with the habit of the preceding. Stem erect or ascending, slender, usually branched margin, always entire, revolute and mucronate at the tip. Flowers as in the Asia. April- *Malta*, rather rare, in fields of cumin in the district "Tal

rarely opposed, simple, exstipulate, usually studded with resinous glands. Flowers hermaphrodite, axillary, on one flowered pedicels, rarely cymose, without bracts. Calyx 5- scarious. Corolla monopetalous with 5 lobes, with imbricate aestivation.

corolla, alternate with the lobes, one being missing or abortive, on filiform filaments, with introrse anthers. Ovary superior, 2 celled, sometimes more or less 4 celled, with a terminal simple style, having an emarginate or sometimes

anatropous. Fruit a drupe, or nearly dry, with 1 to 4 cells. Seeds with scanty fleshy albumen.

The family includes abo New Zealand, the Mascarene Islands, Sandwich Islands, South Africa, Japan and China. They have no economic uses.

#### MYOPORUM BANKS IN SOLAND.

Calyx 5 fid or almost 5- th short tube, campanulate or funnel shaped, 5- -lobed, usually white, with or

4, didynamous, or subequal; sometimes 5 or 6, included or just exerted. Ovary with 2 -celled ovaries.

rarely opposed, entire or toothed. Flowers on short pedicels, often in axillary clusters. Includes about 20

to 5 m high. Leaves lanceolate, fleshy, restricted to a short petiole, acute, serrated, obscurely dotted, glabrous. Flowers in axillary clusters, white, d purple at the throat. Drupes ovoid, purplish red. (S) Australia. April- *Malta* and ; cultivated for ornament along roads etc., and often

met with self-sown and naturalised.-*Myoporum insulare* R. Br. E. Australian Bush.

## ORD. RUBIINAE.

### RUBIACEAE.

Herbaceous or woody plants, often large trees, usually with quadrangular jointed stems. Leaves simple, usually with quadrangular jointed stems. Leaves simple, usually entire, stipulate and opposed: stipules various, often equal to the leaves, axillary buds being found only in the axils of the true leaves. Flowers actinomorphic, usually small and hermaphrodite, grouped in axillary or terminal cymes, panicles or heads. Calyx superior, tubular, with 2-6 teeth, or more or less deeply cleft. Corolla superior, gamopetalous, usually funnel-shaped, or hypocrateriform or rotate, with 4-6 segments, rarely bilabiate and almost zygomorphic. Stamens 4-6, rarely reduced to 2, inserted on the tube; anthers bilocular with longitudinal dehiscence. Ovary inferior, with 2 or more cells, surmounted by a fleshy disk. Style simple, bifid or multifid. Ovules usually one, sometimes two or more, in each loculus. Fruit a capsule, berry or drupe, often a dehiscent. Seeds with albumen of various types, rarely without albumen.

This large family includes 346 genera, with over 4,000 species, mostly natives of tropical and subtropical regions.

To the Rubiaceae belong the various species of coffee, viz: *Coffea arabica*, *C. liberica*, *C. robusta* etc. natives of Africa and Arabia. Various species of *Cinchona* natives of South America, such as *C. Calisaya*, *C. officinalis*, *C. succirubra*, *C. ovalifolia*, *C. Condaminea* etc. furnish the various sorts of *Cinchona* bark, a well known tonic and febrifuge. The bark of various species of *Emijia* of South America, is often used as a substitute for the *Cinchona*. The flowering tops of various species of *Galium* were formerly used in infusion as a galactagogue, and were used also for curdling milk. The root of *Rubia tinctorum*, and to a less extent that of *R. peregrina*, contains a red colouring matter (alizarine) used in the industries. The root of *Cephaelis Ipecacuahna* is a powerful emetic and diaphoretic, and contains the alkaloid emetine. Certain false *Ipecacuahnas*, such as *Psychotria emetica*, *Richardsonia scabra* etc. are also powerful emetics. The substance called gambir, a powerful astringent, is the produce of *Uncaria Gambir*.

### PUTORIA Pers.

Flowers sessile in terminal cymes. Calyx shortly tubular, with 4-5 teeth, semisuperior, adherent to the ovary. Corolla funnel-shaped, with a long tube, slender and cylindrical, with 4 reflexed segments. Stamens 4, hardly protruding, with introrse anthers. Style bifid at the tip. Fruit a fleshy diachene, made of 2 connate achenes enclosed in the calyx, with one oblong seed in each. Species 3, natives of the Mediterranean region.

PUTJORIA CALABRICA (L.f.) D.C. Plant perennial, with a woody rootstock, and strongly fetid. Stems much branched, ascending, and often rooting at the base, glabrous or slightly pubescent, 1-3 diameter long. Leaves usually opposed, lanceolate, glabrous or somewhat ciliated, a little glaucous, with margin slightly convolute, obtuse or acute. Teeth of calyx oval-obtuse. Corolla rosy white or flesh-coloured, with lanceolate acuminate segments. Anthers red. (S) Mediterranean region. May-June. *Malta*, rare, on the rocky sides of Wied il Ghasel, near Musta.-*Asperula calabrica* L.f.-*Ernodea calabrica* Lk.-*Pavetta foetidissima* Cyr. The local plant has anthers of the same colour as the corolla.

### RUBIA (Tourn.) L.

Flowers in axillary cymes forming a paniced inflorescence. Calyx wanting or residual. Corolla with a short tube, campanulate, 4-5 cleft. Stamens 4-5 inserted on the tube; filaments short, anthers introrse. Style 2, connate at the base, each bearing a more or less globular stigma. Fruit usually a didymous berry, fleshy, often reduced to one carpel. Seed reniform. Includes about 30 species natives of the Mediterranean region, Tropical and Temperate Asia, South Africa, and Tropical and South America.

RUBIA PEREGRINA L. Plant perennial, stem woody and persistent at the base, with long suckering reddish-yellow roots. Stem branched, prostrate or climbing, quadrangular, glabrous, with hooked thorns or almost smooth, 3-15 diameter long. Leaves sessile, persistent, oval or oval-lanceolate, acute, in whorls of 4 or 6, coriaceous, shining, thorny or toothed on the dorsal side of the midrib and along the margin. Flowers in opposed axillary and terminal cymes, on trichotomous peduncles, with oval or elliptical bracts. Corolla greenish campanulate-rotate, with abruptly acuminate and recurved segments. Anthers roundish; stigma globose. Berries globose, shining black. (P) Mediterranean region and the Canaries. April-June. *Malta*, rather rare, at Ahrax, Melleha, Gnien Ingrau, ghain tuffieha, majesa, Bahria, Gneina, Boschetto, Gnien il Cbir, Ghirghenti, Wied Babu, Wied Encita, Wied il Ghasel, Wied Filep etc. Gozo, Xlendi, Imgiar ix-Xini, Gnien Xibla, Nadur etc. E. Wild Madder, Evergreen Cliver.

Var. *lucida* L. Leaves shorter, broadly oval, obovate or oblong, of a very shining green on the upper surface. Plant smaller. At Boschetto, Dingli, Melleha, and probably elsewhere.-R. *Bocconeii* Pet.-R. *peregrina* var. *latifolia* Gr. Et Godr.

Var. *angustifolia* L. Leaves longer, narrowly lanceolate or almost linear. With the species, in more sunny situations, as at Wied Babu, Ghirghenti, Ahrax and Melleha.

### GALIUM (Tourn.) L.



Flowers in axillary and terminal cymes on short peduncles forming a paniced inflorescence. Calyx very short and almost wanting, hardly toothed. Corolla rotate, 4-5 toothed. Stamens 4, rarely reduced to 3, inserted on the base of the corolla. Styles 2, connate at the base, with a more or less globose stigma on each. Fruit a dry diachene, rarely somewhat fleshy, usually separating into two carpels at maturity, and each containing one seed with the pericarp adhering to it. Includes about 250 species, distributed all over the world, mostly in temperate regions.

**GALIUM APARINE L.** Plant annual, with quadrangular, prostrate, ascending or even climbing stems, 5-10 diameter long, with hooked thorns along the angles, swollen and hairy at the nodes. Leaves in whorls of 6-8, oblong or oblong-lanceolate, long and acuminate, glabrous on the lower surface, hispid and scabrous on the upper surface, and with hooked thorns along the margin. Flowers in small axillary cymes, on peduncles becoming erect after flowering and longer than the leaves. Corolla white or greenish yellow. Fruit rather large, 4-5 mm in diameter, hispid, with hooked hairs inserted on tubercles. (A) Europe, North Africa, Western and Northern Asia and North America. March-May. *Malta*, *Gozo*, and *Comino*, frequent in valleys, on waste lands, and especially among fruit trees, hedges and growing crops.-*Galium agreste* Wallr. E. Burweed, Cleavers. I. Speronella, Attacca-mani, attaccaveste. M. Harxaja.

The form: intermedium Merat. With tubercled but glabrous fruits, is frequent in shaded situations among fruit trees, crops of sulla etc.

Var. *spurium* L. Stems hardly swollen and glabrous at the nodes. Leaves more narrow, almost linear. Fruit much smaller and glabrous. With the species, chiefly among growing crops-*Galium hispidum* Roth.-*G. agreste* var. *leiospermum* Wallr.

Var. *Vaillantii* D.C. Stems u.s. Leaves linear. Fruit u.s. and hispid. More frequent than the preceding variety, among fruit trees and growing crops.-*Galium infestum* W. et K.-*G. agreste* var. *echinospermum* Wallr.

**GALIUM SACCHARATUM All.** Plant annual, with a prostrate or ascending stem more or less branched, 1-3 diameter long, furnished with hooked thorns. Leaves in false whorls of 6 to 7, linear-lanceolate, rarely obovate, acuminate, with hooked thorns along the margin. Flowers in axillary cymes of about 3 flowers, of which the central is hermaphrodite and the laterals male. Peduncles shorter than the leaves, and recurved after flowering. Corolla whitish. Fruit large 5-6 mm in diameter, verrucose, solitary (A) Central and South Europe, North Africa, Palestine and the Canaries. January-May. *Malta*, *Gozo* and *Comino*, common in fields and on uncultivated ground. E.. Bed-straw, Burweed. I. Speronella, Attacca-vesti. M. Harxaja.-*Vaillantia Aparine* L.-*V. saccharata* C.C. Gmcl.-*Galium Vaillantia* Web. In Wigg.-*G. verrucosum* Sm.

**GALIUM TRICORNE With.** Plant annual, with a prostrate and ascending or erect stem, simple or branched, quadrangular, 1-4 diameter long, furnished

with hooked thorns along the angles. Leaves in false whorls of 6-8, oblong-linear, acuminate, glabrous on the upper surface, with hooked thorns along the margin. Flowers in axillary cymes of 2 or 3 flowers, all hermaphrodite, on peduncles shorter than the leaves and recurved after flowering. Corolla white. Fruit u.s. granular, sometimes smaller. (A) Central and Southern Europe, as far as the Himalaya, North Africa; naturalised in North America. March-April. *Malta* and *Gozo*: rather common among growing crops.-*Vaillantia tricornis* Roth.-*V. triflora* Lam.-*Galium spurium* Balb. Non L. M. Harxaja.

**GALIUM MURALE (L.)** all. Plant annual; stem slender, branched, 1-2 diameter long, glabrous. Leaves oblong or oblong-lanceolate, in whorls of 4, glabrous, the uppermost often solitary. Flowers in extra-axillary cymes of 1-3 flowers, on solitary or opposed short peduncles, recurved after flowering. Corolla yellowish, with incurved segments. Fruit almost cylindrical, slightly curved at the tip, furnished with long spreading hairs, especially at the apex. (A) Mediterranean region. March-April. *Malta*, *Gozo* and *Comino*, common on uncultivated and rocky wastes, in valleys, along roads.

The form: *hispidulum* Guss., scabrous and hispid, with whitish hairs along the stem and on both surfaces of the leaf, is rare, and has been found at Ramla and Marsalforno in *Gozo*, but probably exists elsewhere.-*Callipeltis muralis* Moris.-*Galium fragile* Pourr.-*G. minimum* R. et S.-*Sherardia muralis* L.

#### VAILLANTIA (Tourn.) L.

Axillary cymes of three flowers, of which the central is hermaphrodite and the two laterals male. Hermaphrodite flowers, with calyx almost wanting; corolla rotate, with short tube and 4 segments; Stamens 4, with recurved filaments and introrse bilocular anthers; ovary 2-celled with one ovule in each cell, and with 2 styles. Fruit a diachene, surmountd by the teeth of the calyx, with 2 seeds of which only one is usually fertile. Male flowers with rotate corolla of 3 segments and with 3 stamens. The 3 pedicels of the flowers forming the cyme, are fused together in the fruit, each with a thorny ridge on the dorsal side and prolonged into an appendix, of which the central bears the fruit and becomes recurved. Seed adhering to the pericarp. Includes two species.

**VAILLANTIA MURALIS L.** Plant annual, with prostrate or ascending stem, simple or branched, almost glabrous, 5-20 cm long. Leaves in false whorls of 4, obovate, obtuse. Flowers in subsessile axillary whorls forming a long terminal spike-like leafy inflorescence. Calyx with 5 unequal setaceous segments. Corolla yellowish. Fruit glabrous, with 4 horn-like appendages, hooked at the top, except the dorsal one which is straight. Achenes smooth, reniform. (A) Mediterranean region. February-May. *Malta*, *Gozo*, *Comino*, *Cominotto* and *Selmun*, very common in rocky and stony localities and along roads. E. Cross-wort. I. Erba-croce.-*Galium vexans* Rehb. The form: *hirsuta* Guss., hispid and hairy, is also frequent in the same localities as the species.

**VAILLANTIA HISPIDA L.** Plant u.s. Stem more slender, and hispid and seabrous. Fruit hispid, with 3 horn-like appendages, the dorsal one being wanting; lateral ones not hooked at the tip, all finishing with bristle-like hairs

longer than in the preceding species. Achenes globose, tuberculose. (A) Mediterranean region as far as Persia and Abyssinia, Canaries, March-April. Gozo, rare in the neighbourhood of Ramla; *Comino*; also rare.-*Galium hispidum* Gaertn.

#### SHERARDIA L.

Flowers in terminal clusters surrounded with an involucre of leaf-like bracts connate at the base. Calyx with 4-6 teeth. Corolla funnel-shaped, with long tube and 4 segments. Stamens 4, protruding, and inserted on the throat of the tube, with elliptical introrse anthers, Style filiform, thickened at the base and terminating in 2 stigmas. Fruit globose, bilocular, surmounted by the teeth of calyx, with one semilunar seed in each cell. Includes only one species.

SHERARDIA ARVENSIS L. Plant annual, rarely biennial, with many slender quadrangular stems, prostrate or ascending, more or less scabrous, 5-20 cm long. Lower leaves opposed, obovate, obtuse: middle leaves in whorls of 4, spatulate and acuminate; upper leaves in whorls of 4, spatulate and acuminate; upper leaves in whorls of 6, linear-lanceolate, all sessile or subsessile, hispid on the upper surface and along the margin. Flowers subsessile, in terminal clusters of 8-10. Lobes of corolla oblong, slightly shorter than the tube. Fruit hispid with short curved thorns. (A) or (B) Europe, North Africa, Western Asia; naturalised in North America. February-May. *Malta, Gozo, Comino, cominotto, Selmun, Filfolà*, very common in fields, gardens, waste ground, valleys, roads etc.-*Asperula Sharardi* Hoeck. E. Field Madder. Spur-wort. I. Toccamano. M. Harxaja.

#### ASPERULA L.

Flowers in cymes or clusters forming a panicle or heads. Calyx almost wanting. Corolla funnel-shaped or campanulate, with 4, rarely 3, segments. Stamens 4, included, inserted on the throat of the corolla, with introrse anthers, Style filiform terminating in 2 stigmas. Fruit globose, a diachene, dry or somewhat fleshy, with one seed in each cell adherent to the pericarp. Includes about 80 species, natives mostly of the Mediterranean region, a few being found in India and Australia.

ASPERULA CYNANCHICA L. Plant perennial, with many prostrate or ascending stems, 1-5 diameter long, glabrous or hairy, stiff, with more or less long internodes. Leaves in whorls of 6 or 4, the upper opposed narrowly linear, acute, somewhat scabrous and revolute at the margin, glabrous or hairy. Flowers subsessile, in cymes forming a panicle, furnished with lanceolate bracts. Tube of corolla long and slender, with obtuse or acute lobes shorter than the tube, or about as long, white internally, flesh-coloured and granulose or hairy externally. Fruit scabrous and granulose or hispid. (P) Central and Southern Europe, North Africa. January-November. *Malta, Gozo and Comino*, frequent in valleys and in rocky and dry localities. The form: *subulata* Pospic., with very narrow and acuminate lobes, and the form:

breviflora Tanf., with lobes half as long as the tube, are met with along with the type in rocky dry localities.-*Galium cynanchicum* Scop. E. Quinsy-wort.

Var. *aristata* L. f. Plant glabrous and well-developed with very long internodes., with mucronate leaves, and cuspidate bracts. Tube of corolla 2-3 times as long as the lobes, which are acute and usually terminate in an awn or cuspidate. Flowers yellowish white, reddish internally.-*asperula aristata* var. *meridionalis* Terr. A. Frequent among *Erica* and other shrubby plants in Wied Encita, Wied Musta and probably elsewhere.

Var. *longiflora* W. et K. Plant with much shorter internodes, somewhat scabrous. Tube of corolla about twice as long as the lobes. Flowers more reddish, scabrous or glabrous externally. Frequent in arid and exposed situations.

### CRUCIANELLA L.

Flowers in cymes forming spikes or heads, furnished with bracts and bracteoles. Calyx almost wanting. Corolla funnel-shaped, with 4-5 lobes. Stamens 4-5 inserted on the tube and included, with long introrse anthers. Style bifid. Fruit a diachene, with 2 oblong connate carpels, each containing one seed adherent to the pericarp. Includes about 26 species, natives of the Mediterranean region as far as Persia and the Caspian.

CRUCIANELLA LATIFOLIA L. Plant annual, with simple or branched stem, ascending or erect, scabrous, 2-4 diameter long. Lower leaves oblong or lanceolate; upper leaves linear-lanceolate, scabrous along the margin, glabrous, in whorls of 4 or 5, rarely 6. Bracts 4, of which the two outer are connate at the base, all equal and ciliated along the margin. Flowers sessile, in terminal spikes 1-2 diameter long, on long peduncles. Tube of corolla longer than the bracts, with 4 lobes. (A) Mediterranean region. March-June. *Malta*, on rocky sea-side places at Sliema, according to Delicata; but apparently has disappeared.

CRUCIANELLA RUPESTRIS Guss. Plant perennial and bushy, with a woody reddish creeping root; and stems woody at the base, suffruticose, whitish, much branched, densely covered with leaves imbricated in 4 rows, lanceolate, acute, equal to or longer than the internodes, glaucous or greenish. Bracts all equal, the outer one flat, keeled at the back, the others concave, keeled, with a membranous ciliated margin. Flowers in short spikes. Tube of corolla much longer than the bracts, with 4 rarely 5, obtuse lobes shortly mucronate. (P) Mediterranean region. (Egypt, Lampedusa). April-June. *Malta*, frequent on rocky ground not far from the sea, and sometimes on cliffs at some distance inland. St Julians to Melleha, Ahrax, Gneina, ghain Tuffieha, Bahria, Imtahleb, Dingli, Wied Babu etc; Gozo, Cala Dueira, Ramla, marsalforno, Kbaijar, ta Cenc, Imgiar ix-Xini, Kala; *Comino* and *Cominotto*.-*Crucianella maritima* Forskaal non L. e. Cross-wort.

### CAPRIFOLIACEAE.

Plant perennial, usually woody, very rarely herbaceous. Leaves opposed, stipules absent or greatly reduced or modified. Flowers hermaphrodite. Calyx superior, 5-cleft or toothed. Corolla superior, gamopetalous, actinomorphic or zygomorphic, with 5 lobes. Stamens inserted on the tube, and alternate with the lobes. Filaments filiform. Ovary inferior, 2-5 celled, with terminal simple style: stigma capitate or bilobed, sometimes sessile and then there are 3-5 stigmas. Ovules anatropous and pendulous. Fruit a berry with several cells, rarely one-celled. Seeds with straight embryo and fleshy albumen, enclosed in a bony or crustaceous testa. The family includes 11 genera and about 262 species, mostly natives of temperate regions of the northern hemisphere, a few being found in tropical America and Australia.

The berries of *Lonicera Caprifolium* are diuretic; other species have laxative properties. The dwarf Elder, *Sambucus nigra*, has laxative berries, which are occasionally used in the fraudulent colouring of wines. The dried flowers are sudorific, as also those of *Sambucus Ebulus*. These last have also astringent properties, and are used to infusion in lotions for the eyes. The leaves as astringent and vulnerary. The bark of *Viburnum prunifolius* and of *V. Opulus* is used as uterine sedative and antispasmodic.

#### SAMBUCUS (Tourn.) L.

Flowers in large corymb-like inflorescence or in panicles, the outer flowers being often sterile and larger. Calyx 5-toothed. Corolla with a very short tube, rotate, 5-lobed. Stamens 5 inserted on the throat of the corolla, with extrorse bilocular anthers. Stigma trilobed and sessile. Fruit a 3-locular or unilocular drupe, with 3 to 5 seeds. Includes about 20 species natives of temperate regions.

**SAMBUCUS EBULUS L.** Plant with a perennial and suckering rootstock, and with annual stems; fetid in its green parts. Stems herbaceous, glabrous or slightly pubescent, erect, slightly branched, 8-15 diameter high. Leaves large, pinnatifid with 5-9 segments, lanceolate, toothed or serrated, sometimes more deeply cut. Flowers in terminal trichotomous cymes, lower down, and then dichotomous; each flower on a short pedicel. Corolla white or flesh-coloured. Drupe subglobose, black, with blood-red juice. (P) Europe, North Africa, Western Asia. April-May. *Malta*, rare, at Gnien il Cbir, Gomerino, Gnien Fieres. *Gozo*, Wied il Luziata and Xlendi, where it is frequent; and at Gnien Xibla, near Xaghra, E. Dwarf Elder. I. Colore, Ebbio, Ebbiolo. M. Sebuka salvagga.

**SAMBUCUS NIGRA L.**, the Common Elder (M. Sebuka) is frequently cultivated in gardens for use in domestic medicine, and for its white flowers, but it hardly ever produces ripe fruits, and is grown almost always from cuttings.

**VIBURNUM Tinus L.**, is also frequently cultivated for ornament, and is sometimes met with self-sown in old gardens.

## LONICERA L.

Flowers zygomorphic, either solitary or in clusters forming false whorls at the extremity of the branches. Plants perennial and woody, often more or less voluble. Calyx 5-toothed, short. Corolla tubular, or funnel-shaped, bilabiate, upper lip 4-lobed or 4-toothed, lower lip entire. Stamens 5, inserted on the tube of the corolla, exserted or included, with introrse 2-celled anthers. Style filiform, with 3-lobed stigma, rarely entire. Fruit a berry with 3 cells, fleshy, usually surmounted by the calyx, two of the cells being often sterile or abortive, with 2-3 seeds in each cell. Includes about 100 species, natives of the northern hemisphere, mostly of Western Asia and the Himalaya.

*LONECERA IMPLEXA* Ait. Stem voluble, branched, glabrous and usually glaucous. Leaves thick and coriaceous, entire, persistent, sessile; floral leaves more or less connate, all green on the upper surface and glaucous on the lower surface. Flowers in sessile clusters, in the axil of connate cup-shaped leaves. Teeth of calyx short and obtuse. Corolla slightly hairy, yellowish-red or pink: upper lip with 4 obtuse lobes; lower lip entire and longer. Bracts obovate; berries oval, glabrous and glaucous, red at maturity. Leaves sometimes ternate, more or less connate, except the lowermost. (S) Mediterranean region. April-May. *Malta*, frequent at Wied Babu, Boschetto, Melleha, Wardia, Ta baldu, Makluba, Wied Gherzuma, Ahrax, Puales, Bahria, etc. *Gozo*, at Imgiar ix-Xini, wied Korrot, Migiarro near Chambray, Nadur, Xlendi etc.

*LONICERA CAPRIFOLIUM* L. the Honeysuckle, native of Europe, and *L. japonica* Thunb. Native of China and Japan, are often cultivated in gardens and are sometimes met with self-sown.

## VALERIANACEAE.

Plants annual or perennial, mostly herbaceous. Radical leaves rosulate or fascicled; cauline leaves opposed; all simple and exstipulate, furnished with a dilated petiole. Flowers mostly hermaphrodite and more or less zygomorphic, in dichotomous cymes or a corymb-like inflorescence, furnished with bracts. Calyx superior, with unequal teeth or with bristles. Corolla monopetalous, superior, more or less tubular or funnel-shaped, tube often spurred or gibbose, with 5 lobes, or with 4-3 lobes and almost bilabiate. Stamens inserted on the tube, usually 4, sometimes 5 or 3, alternate with the lobes, filaments protruding, with introrse 2-celled anthers. Ovary superior, 3-celled, of which only one cell is fertile, containing a solitary anatropous pendulous ovule. Style simple; stigma simple or 2-3-fid. The fruit is a dry one-seeded achene: embryo straight and exalbuminous.

The family includes 8 genera and about 300 species mostly natives of temperate and cold regions.

The rhizome of the perennial *Valeriana officinalis* has well defined antispasmodic properties, contains valerianic acid and is often used as a nervine sedative. Certain species of *Valerianella* are used for salad.

#### CENTRANTHUS D.C.

Flowers in corymbs or panicles. Calyx of many small teeth which become modified as a pappus of plumose bristles. Tube of corolla prolonged below in a long spur; limb of corolla with 5 unequal lobes. Stamens reduced to one, inserted on the throat of the tube, with a 2-celled anther. Style simple with a bilobed stigma. Fruit unilocular, with one seed, and surmounted by the pappus. Includes 12 species, natives of the Mediterranean region.

**CENTRANTHUS RUBER (L.) D.C.** Plant perennial, woody at the base, with annual cylindrical or angular fistulose stems, erect or ascending, glabrous and somewhat glaucous. Lower leaves petiolate, oval, obtuse; the others sessile, oval-lanceolate, acuminate, or lanceolate, opposed or rarely in whorls of three, entire, or somewhat toothed at the base, glabrous and glaucous. Corolla rose-coloured, brick-coloured or white. Stamen and style exerted. Fruit conical-compressed, glabrous, with 4 ridges on one side and 3 on the other. (P) Mediterranean region and Madeira. April-July. Naturalised in the crevices of walls, rocks and on walks in old gardens, as at San Antonio (*Malta*). E. Fox's brush, Spur Valerian. I. Savonina M. *Valeriana*, Toppu tar-Regina.-*Valeriana rubra* L.

**CENTRANTHUS CALCITRAPA (L.) Dufr.** Plant annual, with a simple or branched stem, erect, fistulose, glabrous or glaucous, 5-20 cm high. Leaves opposed, the radical and the lower cauline lyrate-pinnatifid, petiolate, with toothed or cut lobes, the terminal lobe being much larger; the middle and upper leaves sessile, pinnatifid, the uppermost almost entire. Flowers in terminal trichotomous corymbs, forming a panicle, furnished with linear-lanceolate bracts equal to the pedicels. Corolla light pink, having at the base of the tube a gibbose obtuse spur as long as the ovary, and the limb divided into 5 lanceolate lobes. (A) South Europe, Cyprus, Algeria. March-May. *Malta*, Wied Encita, Wied Babu, Boschetto, Wied Kirda, Ta Baldu, Bahria, Wied Gherzuma, Gneina etc. Gozo, Imgiar ix-Xini, Xlendi, Wied Korrot, Wied ir-Rihan, Migiarro near Chambray, Kala etc. The white-flowered form: (*albiflorus* mihi.) is also present but rare.-*Valeriana Calcitrapa* L.

Var. *orbiculatus* Dufr. Radical and cauline leaves oval or roundish, the others pinnatifid at the base.-*Valeriana orbiculata* S. et C. At Wied il Ghasel and Wied Encita.

#### VALERIANELLA (Tourn.) Pollich.

Flowers solitary in false dichotomous heads or corymb-like inflorescence, furnished with bracts. Calyx various or almost wanting. Corolla funnel-shaped, with limb cut into 5 unequal lobes. Stamens 3, inserted on the throat of the corolla, with introrse 2-celled anthers. Fruit, an achene with two empty or sterile cells and one fertile cell containing one seed, surmounted by the

persistent limb of the calyx, if it exists, and often accrescent. Includes about 50 species, natives of Europe, the Mediterranean region and North America.

**VALERIANELLA CARINATA** Lois. Plant annual, with an erect, slightly angular, dichotomous stem, with spreading branches hairy along the angles. Leaves entire, ciliated along the margin, and along the midrib on the dorsal side; the lower obtuse and spatulate, the upper linear and acute. Flowers in dense corymbs, with linear obtuse bracts, slightly longer than the fruit. Corolla pale blue. Fruit oblong, slightly quadrangular, deeply furrowed on the ventral surface, with a filiform ridge on the dorsal side, with a ridge and a furrow on the lateral sides, surmounted by a small tooth of the calyx. (A) Central Europe and the Mediterranean region. April-June. *Gozo*, *Migiarr*, according to *Gulia*.-*Fedia carinata* Stev.-*Valerianella praecox* Wk. E. Corn-salad.

**VALERIANELLA PUBERULA** (Bert. in Guss) D.C. Plant annual, with an erect smooth and glabrous stem, 5-20 cm high, dichotomously, branched. Leaves u.s. not ciliated along the margin. Flowers blue, in dense corymbs, with erect scarious bracts longer than the fruit and not ciliated along the margin. Calyx entire, not ciliated. Fruit very small, oval, covered with short applied hairs, surmounted by the calyx. (A) South Europe and North Africa. April-May. *Malta*, rare, at *Marfa*; in sandy localities-*Valerianella microcarpa* soy. Non Lois.-*Fedia puberula* Bert. in Guss.

**VALERIANELLA TRUNCATA** Beteke. Plant annual, stem erect, slightly angular, scabrous along the angles, dichotomously branched from the base, 1-2 diameter high. Lower leaves oblong-obovate, entire; the upper almost linear; often toothed at the base, hispid along the margin and the dorsal midrib. Flowers pinkish or pale blue, in dense corymbs, furnished with erect hastate bracts, scarious and ciliated along the margin, shorter than the corymb of ripe fruit. Calyx with a truncated limb obliquely cut; fruit very small, oval, convex on the dorsal side, with a prominent ridge on each side, surmounted by the persistent calyx. (A) South Europe. April-May. *Malta*, rather rare, *Calafra*, *Ghirghenti*, *Zebbieh*, *Gneina*, etc. *Gozo*, *Xlendi*, *Imgiar ix-Xini*, *Nadur*.-*Fedia truncata* Rehb. E. Italian Corn-salad.

**VALERIANELLA IOCARPA** Dew. Plant annual, u.s. Leaves u.s. Bracts about as long as the corymb of ripe fruit. Fruit very large comparatively, rugose-reticulate on its dorsal side, hairy all over, or only along the ridges, or sometimes (form: *leiocarpa* Kock.) entirely glabrous, surmounted by the persistent calyx in the shape of a complete collar, somewhat obliquely truncated and slightly toothed. (A) Central Europe, Mediterranean region, and the Canaries. March-April. *Malta* and *Gozo*, frequent in fields and also on rocky waste lands and valleys-*Valerianella campanulata* Biv.-*Fedia eriocarpa* Horn.-*F. rugulosa* Spreng.

**VALERIANELLA CORONATA** (L.) D.C. Fl. Franc. Plant annual; stem erect, quadrangular, hispid along the angles, 1-3 diameter high, dichotomously branched above. Leaves ciliated, the lower oblong, the upper linear-lanceolate or linear, toothed or deeply pinnatifid at the base. Flowers in



dense globose corymbs, furnished with lanceolate applied bracts, ciliated along the margin and shorter than the corymb of ripe fruit. Limb of calyx glabrous, about as long as the fruit and broader, with erect triangular lobes. Fruit oval, hairy, convex and with 3 ridges on the dorsal side. (A) Central Europe and the Mediterranean region. March-May. *Malta*, very rare, corradino; Gozo, also rare, at Migiarrro and Ta Cenc, according to Gulia.

#### FEDIA Gaertn.

Flowers in clusters borne on thickened peduncles and furnished with imbricate bracts. Calyx reduced to a mere ring and 4 very small teeth. Corolla with a long slender tube, and a bilabiate limb the upper lip being bilobed and the lower lip trilobed. Stamens 2, inserted just within the throat, exserted, and with introrse anthers. Style simple, with bilobed stigma. Central fruits fertile with only one seed, lateral fruits sterile. Includes only one species.

FREDIA CORNUCOPIAE (L.) Gaertn. Plant annual; stem erect, glabrous or pubescent, simple or branched from the base, branches dichotomously branched above, 1-3 diameter long. Leaves glabrous, the lower oval or roundish and petiolate, entire or slightly toothed, the upper subsessile or sessile, oblong, obtuse or acute, entire above and toothed at the base. Flowers in clusters, furnished with bracts of which the lower are oblong-acuminate, the other smaller and linear, all ciliated along the margin and with reflexed acuminate apex. Corolla purplish red; fruits glabrous, the lower oval, the upper narrower, all surmounted by the persistent calyx in the shape of a collar. (A) South Europe and North Africa. January-May. *Malta*, *Goso* and *Comino*, quite common in fields, valleys and on uncultivated or waste ground. The white-flowered form: *albiflora* Strobl., is met with in many places, usually as single specimens.-I. Ciocca. M. Siek il Hamiema or Lsien il Hamiema.

### DIPSACEAE.

Herbs annual or perennial, with exstipulate, opposed, or sometimes whorled leaves. Flowers hermaphrodite, more or less zygomorphic, in a dense head surrounded by an involucre of bracts. Calyx superior, monosepalous, cup-shaped, or in bristle-like segments. Corolla superior, monopetalous, tubular, with 5-4 irregular lobes. Stamens 4, rarely 2-3, alternate with the lobes of the corolla and inserted at the bottom of tube; filaments protruding; anthers bilocular and introrse. Ovary inferior, usually enclosed in a free or partly adherent receptacular tube or involucre. Style terminal, simple, filiform. Embryo straight with scanty albumen. This small family includes 5 genera and about 120 species, mostly natives of the Mediterranean region.

*Scabiosa atropurpurea* I used as a depurative in cutaneous diseases. The root of *Dipsacus sylvestris* is a diuretic and diaphoretic. The heads of *Dipsacus Fullonum* are used by fullers for carding cloths.

#### DIPSACUS (Tourn.) L.

Flowers in globose or oblong heads, furnished at the base with an involucre of thorny or herbaceous bracts, and with spinous herbaceous bracteoles at the base of each flower. External calyx (involucel) tubular, quadrangular, with a groove, and toothed or ciliated along the margin. Internal calyx with a cup-shaped free margin, hairy, entire or slightly toothed. Corolla funnel-shaped, with 4-5 lobes, of which the anterior is larger, the ray flowers being the same as the others. Stamens 5, exserted. Style filiform, with club-shaped stigma, obliquely grooved. Fruit an angular achene, enclosed in the involucel, surmounted by the limb of the calyx. Includes about 12 species natives of Europe, Asia, North Africa and Abyssinia.

**DIPSACUS SILVESTRIS** Huds. Plant annual, with an erect, rigid stem, glabrous, grooved, and thorny, 1-2 m high, branched above. Radical leaves rosulate, oblong, glabrous or with bristles, with a short petiole; cauline leaves oblong-lanceolate, toothed; the upper leaves lanceolate, entire or pinnatifid, the uppermost linear-acuminate. Flower-heads 5-8 cm long, furnished with linear bracts thorny along the margin, and with concave coriaceous oblong bracteoles abruptly acuminate. Outer calyx or involucel pubescent; inner calyx with narrow tube, terminating in a deciduous quadrangular hairy limb. Corolla lilac, rarely white; anthers blue. (A) Central Europe, Mediterranean region and the Canaries. June-July. *Malta*, very rare, at Wied Gherzuma, according to *Delicata-Dipsacus fullonum* var. *a. L.-D. vulgaris* c.C. Gmel. E. Barber's brushes. Wild Teasel. I. Cardo, Scardaccione. M. Cardun salvagg.

#### SCABIOSA (Tourn.) L.

Flower-heads at first almost flat, and then hemispherical or elongated, furnished with an involucre of bracts and with bracteoles. Involucel (outer calyx) with 8 ridges, and surmounted by a collaret, toothed, scarious, rotate or campanulate. Internal calyx tubular, terminating in 5, rarely 4 to 10 glabrous or somewhat ciliated bristles. Corolla funnel-shaped, with 5 rarely 4 lobes, mostly unequal, especially in the outer lobes of the ray flowers. Stamens 4, rarely 2 or 3, inserted on the tube of the corolla, with oblong anthers. Style filiform, clavate at the tip, with a pit-like stigma. Fruit an angular achene, enclosed in an involucel, and surmounted by the limb of the calyx. Includes about 80 species natives mostly of the Mediterranean region, but extending over Central Europe, Asia and Africa.

**SCABIOSA ATROPURPUREA** L. Plant perennial, with annual stem, simple or branched, 1-12 dm high. Lower and radical leaves spatulate, petiolate, toothed or cut; the cauline leaves pinnatifid, with a large terminal lobe. Heads at first flat, becoming ovoid at maturity, furnished with oblong-lanceolate bracts, and linear ciliated bracteoles. Ridges of involucel ciliated, collaret scarious and involute. Internal calyx stipitate, finishing in 5 bristles. Ray flowers with radiant corolla. (P) Mediterranean region. The typical form, with large purple flowers and whitish anthers, is cultivated, and is sometimes met with as an escape from gardens. E. Scabious, Pincushion-flower.

Var. *maritima* L. Radical leaves toothed or crenate. Flowers lilac-coloured or mauve, rarely white or pale yellow (form: *luteola* Paolucci.)-var. *lilacina* Tanf. In Parl. May-July. Common in *Malta* and *Gozo*, rare in *Comino*, on rocky and uncultivated or waste ground, along country-roads etc. The form: *grandiflora* Scop.-*S.maritima* var. *macrocephala* Sang. with larger flower-heads, becoming elongated at maturity is frequent on better ground; and the form: *divaricata* Beg.-*Scabiosa ambigua* Ten., with small and rather fleshy leaves and spreading or prostrate stems, is common on rocky ground not far from the sea.

## ORD. SYNANDIRAE.

### CUCURBITACEAE.

Herbs annual or perennial, sometimes suffruticose, with a climbing stem and watery juicy. Leaves alternate, simple, palminerved, often palmilobed, petiolate and usually cordate at the base, with simple or branched tendrils opposed to the leaves. Flowers actinomorphic, monoecious or dioecious, very rarely hermaphrodite, axillary, white or yellow, rarely red. Calyx usually campanulate, 5-toothed or 5-lobed. Corolla gamopetalous, campanulate or rotate, 5-lobed, imbricate in the bud, inserted on the throat of the calyx. Androecium inserted on the base of the corolla and calyx, consisting of two 2-celled and one 1-celled anther, or of five 2-celled anthers with thick short filaments usually monodelphous; anthers extrorse with sinuous cells. Ovary inferior, usually consisting of 3-5 carpels, rarely of 1 carpel, coherent, with parietal placentae reflexed outwards; style terminal, thick, short, trifid, with thick lamellate stigmas, lobed or fringed. Ovules rarely solitary, usually numerous in two series. Fruit a fleshy berry, rarely dry, usually indehiscent. Seeds usually compressed, without albumen.

The family includes 87 genera, and about 620 species, natives of warm and tropical regions, rarely inhabiting temperate regions, in both hemispheres.

The Cucurbitaceae possess more or less bitter and laxative properties, which become very powerful and drastic in certain species, such as *Cucumis Colocynthis*, *Bryonia alba*, *B. dioica*, *B. abyssinica*, and especially in *Ecballium elaterium*. This last is the source of *Elaterium*, which is the inspissated juice expressed from the fruit, and is a most powerful hydragogue and cathartic. Many species such as *cucumis vulgaris* (the common Cucumber), *Lagenaria vulgaris*, (the long gourd) etc. have cooling and soothing properties, owing to which their juice is sometimes used as a cosmetic. The seeds of *Cucurbita maxima* (the common pumpkin), is an old popular remedy for tape-worm, generally considered as very effective and safe. The anthelmintic action is ascribed to a glucoside called preporesin, which resides principally in the inner rind of the seed. The ripe fruit of *Momordica Charantia* and *M. Balsamina*, macerated in olive-oil, is popular as a vulnerary. Many cucurbitaceae, such as *Cucurbita maxima*, *C. moschata*, *C. Pepo*, *C. melanosperma*, *Cucumis sativus*, *C. Melo*, *Lagenaria vulgaris*,

*Citrullus vulgaris*, *Sechium edule* etc. are extensively cultivated as vegetables, or for the sake of their ripe fruit.

#### ECBALLIUM A. Rich.

Flowers monoecious. Male flowers in a raceme; female flowers solitary. Tube of calyx short and campanulate, 5-cleft: corolla campanulate, deeply 5-lobed. Stamens in male flowers, 5, connivent in pairs, one being solitary, with broad, unilocular, flexuous anthers. Female flowers with 3-locular many-ovuled ovary, with a short style and 3 bifid stigmas. Fruit oblong-elliptical, breaking off its insertion of the peduncle at maturity, and thence squirting off the seeds with elasticity. Seeds small, compressed, oblong, smooth, with a very narrow margin. Includes only one species.

ECABALLIUM ELATERIUM (L) A. Rich. Stem prostrate, hispid and verrucose, branched, with short ascending branches, and without tendrils, ( $\frac{1}{2}$  to 2 mm long). Leaves petiolate, oval-cordate or truncated at the base, almost hastate, with a wavy and roughly toothed margin, scabrous and hispid, somewhat fleshy, often almost trilobed. Male and female flowers in the same axil of the leaf, but usually on different peduncles. Segments of calyx almost linear, villous. Corolla pale yellow, with mucronate lobes. Fruit glaucous or greenish, hispid, pendulous when approaching maturity. (P) Mediterranean region. Flowers all the year, but especially in May-August. On waste ground, heaps of rubbish, in valleys etc. in *Malta*, *Gozo Comino* and *Filfol*, especially on clayey soils not far from the sea. Formerly also cultivated for the extraction of Elaterium.- *Momordica Elaterium* L.-*Elaterium cordifolium* Moench.-*Echallium agreste* Rehb.-*E. officinale* Nees. E. Squirting Cucumber. I. Cocomero asinino. M. Fakkus il hmir.

### CAMPANULACEAE.

Herbs, annual, biennial or perennial, usually with a milky juice. Leaves simple, exstipulate, alternate, rarely opposed. Flowers epigynous, actinomorphic, hermaphrodite; in racemes or spikes or small heads, or in panicles. Calyx superior, persistent, with 5 lobes, rarely with 3 or 6 or 8 lobes, with valvate aestivation. Corolla gamopetalous, campanulate, funnel-shaped or tubular, marcescent, with a cleft or lobed limb, and valvate aestivation. Stamens as many as the lobes of the corolla, and alternate with them, filaments connivent by their bases which are usually dilated. Anthers 2-celled, introrse, often coherent into a tube around the style. Ovary inferior, with 2-8 cells; style simple, with longitudinal rows of hairs; stigma usually lobed. Ovules numerous, anatropous. Fruit a many-seeded capsule, with various dehiscence. Seeds minute, many: embryo straight, immersed in a fleshy albumen.

The family includes 60 genera, and about 1,000 species mostly natives of temperate regions, chiefly in the western countries of the old world, and are rare in tropical or warm climates.

Campanulaceae are of little account in medicine. They contain an acrid milky juice, largely neutralised by the presence of abundant and sweetish mucilage and therefore some of them, as *Campanula Trachelium*, were formerly used as demulcents. The fleshy sweet root of *Campanula Rapunculus* is often used as vegetable.

#### CAMPANULA (Tourn.) L.

Calyx adherent to and accrescent with the ovary, with 5 lobes, sometimes with other five reflexed lobes alternating with the first. Corolla superior, usually campanulate, 5-lobed. Stamens 5, filaments expanded at the base, with or without appendices; anthers at first glued together and then free. Style simple, with 2-3 stigmas, rarely 5. Capsule 3-5 celled, dehiscent by means of 3-5 pores or fissures, near its base or its middle. Seeds many, very minute, oval, smooth. Includes about 230 species, natives mostly of the Mediterranean region and of temperate regions of old world north of the equator, from England to Abyssinia.

**CAMPANULA ERINUS L.** Plant annual, with an erect stem, branched from the base, more or less hispid, 50 to 200 cm high. Leaves oval-cuneate, finishing a short petiole; the upper sessile, all toothed and hispid. Flowers solitary, terminal or in the bifurcation of the branches, or axillary; sessile or subsessile, forming an irregular panicle. Calyx hispid, with very short tube, becoming rotate at maturity, with oval-acute lobes. Corolla small, with tube as long as the lobes of the calyx, bluish. Stamens with filaments much expanded at the base and somewhat hairy. Capsule pendulous, trilocular. (A) Mediterranean region, as far as Central Asia, the Canaries and Madeira. March-May. Common in *Malta*, *Gozo* and *Comino*, in gardens, fields, valleys, roads and on rubble walls. -*Wahlenbergia Erinus* Lk. -*Erinia campanula* Noulet-Roucela Erinus Dum. E. Forked Bell-flower.

#### TRACHELIUM (Tourn.) L.

Flowers in a dense terminal or lateral corymb. Calyx 5-cleft. Corolla superior, with a very long and slender tube, with limb divided into 5 narrow lobes. Stamens 5, free; filaments very slender. Style at first included, and afterwards much exerted, with 2 very small obtuse stigmas. Capsule 2-3 locular, somewhat triangular, dehiscing by lateral pores at the base. Includes about 7 species, natives of the Mediterranean region.

**TRACHELIUM CAERULEUM L.** Plant perennial, woody at the base, with erect or ascending annual stems, glabrous, often reddish, 4-8 diameter long. Leaves petiolate, oval or lanceolate, dark green, glabrous, acuminate, serrated. Flowers very numerous and small, in a branched terminal corymb, with many filiform peduncles, each with a bract or bracteole at the base. Calyx glabrous, with 5 narrow erect lobes. Corolla violet-bluish, with 5 spreading, obtuse, lanceolate lobes. (P) Italy, Sicily, Spain and North Africa. May-September. Naturalised in old gardens, as at San Antonio and Boschetto; usually growing in the crevices of walls and in the fissures of the pavement in cool and shaded localities. The plants met with belong to the

typical form, with oval petiolate leaves, doubly and irregularly toothed and serrated, with acute teeth. E. Blue Throat-wort.

### SPECULARIA Heist.

Flowers erect in the axil of a bract; forming axillary racemes or spikes. Calyx accrescent with the ovary, with a long triangular tube, cut into 5, rarely 4 or 3, linear persistent segments. Corolla superior rotate or broadly campanulate, with roundish acuminate lobes, as many as the segments of the calyx. Stamens 5, free, with glabrous filaments. Style short, cylindrical, with 3 papillose stigmas. Capsule triangular, prismatic, dehiscing by means of 3 valves near the apex revolving upwards. Seeds many, minute, elliptical, somewhat flattened, smooth and shining. Includes about 10 species, distributed in the Mediterranean region, Central Europe, and North and South America.

SPECULARIA HYBRIDA (L.) D.C. f. Stem erect, somewhat hispid, angular, branched from the base, with spreading branches, 10-25 cm high. Leaves obtuse, mostly glabrous, with crisp or crenate margin, the lower oval or oblong-spathulate with short petiole, the others sessile and oblong. Flowers sessile in terminal corymb, the laterals shortly pedicelled, or in clusters of 2-3 at the end of the branches, forming a rather dense corymb. Calyx with 5 erect oblong or oblong-lanceolate lobes, scabrous along the margin, shorter than the tube, but about twice as long as the corolla, which is 6-15 mm in diameter and of a vinous red. Capsule hispid along the angles. Seeds oval. (A) March-May. Central and Southern Europe, and North Africa.-*Campanula hybrida* L.-*Prismatocarpus hybridus* L'herit.-*P. confertus* Moench.-*Legouzia hybrida* Gerard. *Malta*, in fields among growing crops; rather rare, at Zebbiegh, Migiarro, Zurriek, Hal Farrug: Gozo, Madonna ta Kala, according to Duthie. The Maltese plants are branched from the base and very pubescent, with large leaves and large segments of the calyx, described as form: *foliosa* by Sommer and Caruana-Gatto. E. Corn-Violet.

## COMPOSITAE.

Plants herbaceous, mostly perennial, sometimes suffrutescent below, or even sarmentose, but very rarely arborescent. Leaves simple, alternate, often much divided, without stipules, but often with stipule-like wings. The inflorescence is typically compound, being a capitulum or head, formed of many flowers surrounded by an involucre of bracts, sometimes with a few flowers, rarely with only one flower. The flowers of each head are inserted on a disk which may be flat, concave or convex, and each floret is often furnished with a bract, or palea or scale or bristle, and is inserted in a depression or pit, owing to which the disk is alveolate.

The florets may be hermaphrodite or unisexual or neutral. The calyx is epigynous, usually scarious or membranous, or divided into paleae or scales

or bristles or hairs, which persist in the ripe fruit forming a sessile or stipitate pappus. The corolla is epigynous, monopetalous tubular and regular, 5-4 cleft or toothed; but is often irregular, ligulate or bilabiate. Stamens usually 5, sometimes 4, inserted on the corolla, with filaments usually free, with bilocular anthers, introrse, connivent in a cylindrical tube, through which passes the style. Ovary inferior, unilocular, uniovular, with filiform bifid style, which in hermaphrodite flowers is hairy at the apex. Ovule straight, anatropous. The fruit is a typical cypsela, usually sessile. The embryo is straight and exalbuminous.

This family, the largest of the Phanerogams, is spread all over the warm and temperate regions of the world, and extends even into the colder regions. It includes 806 genera, and about 12,300 species.

Some Compositae are cultivated for use as salads, such as *Lactuca Scariola* var. *sativa* (the lettuce), *Cichorium Endivia* (Endive), *C. Intybus* (Chicory), *Taraxacum officinale* (Dandelion). *Cynara Cardunculus* (the Cardoon) and *C. Cardunculus* var. *Scolymus* (the Artichoke) are well known vegetables. The tubers of *Helianthus tuberosus* (Jerusalem Artichoke) are used in the same way as potatoes. The roots and tubers of Compositae contain inuline, a sort of starch which is soluble in boiling water, and as during the process of digestion it gives origin to levulose instead of glucose, it is recommendable in the diet for diabetes. Many species of *Aster*, *Dahlia*, *Callistephus*, *Arctotis*, *Gaillardia*, *Chrysanthemum*, *Zinnia*, *Coreopsis*, *Gerbera* etc. are cultivated for ornament.

Several species are used in medicine. *Arnica montana* is a rubefacient and counter-irritant used externally as tincture. It is rarely used internally as stimulant and diaphoretic. The head of *Anthemis nobilis*, the Roman Chamomille, and *Matricaria Chamomilla*, the common Chamomille are tonics, stomachics and antispasmodics. *Santolina Chamaecyparissias* is anthelminthic. Varieties of *Artemisia maritima* furnish the well known Santonin, much used as anthelminthic. Another vermifuge is Tansy (*Tanacetum* or *Chrysanthemum vulgare*). The root of *Inula Helenium* is tonic, aromatic and diaphoretic. The root of *Taraxacum officinale* is a laxative, cholagogue and depurative. The wormwood (*Artemisia Absinthium*) is a tonic, stomachic and anthelminthic. *A. pontica* and *A. arborescens* have the same properties and are used in domestic medicine. *Achillea Millefolium* is used as astringent and vulnerary. *Cnicus benedictus* is much used as a tonic, stomachic and febrifuge. The seeds of *Helianthus annuus* contain abundant oil, and are used to feed poultry; the seeds of *Carthamus tinctorius*, (the Bastard Saffron) are largely used to feed parrots. The root of *Carlina gummifera* contains a resinous principle, and a glucoside (atractylin) which is highly poisonous.

#### SUB-FAMILY TUBULIFLORAE

Flowers all tubular, or only those of the ray ligulate. Plants without laticiferous vessels.

## TRIBE 1-EUPATORIEAE.

Flowers all tubular and hermaphrodite. Receptacle naked. Pappus hairy.

### EUPATORIUM (Tourn.) L.

Heads discoidal, in corymbs. Involucre cylindrical, with imbricate scales. Receptacle flat. Flowers 5-6 in each head, all similar, hermaphrodite, tubular, with 5 toothed limb. Achene angular-striated. Pappus made of one series of white, rigid, scabrous hairs. Includes about 400 species mostly natives of America, only a few being natives of the Old World.

**EUPATORIUM CANNABINUM L.** Plant perennial more or less hairy, with short tortuous hairs. Stems erect, striated, 6-20 diameter high. Leaves opposed, with a short petiole, lanceolate, acuminate, restricted at the base, toothed or serrated. Involucre made of about 10 scales, of which the outer are very short and obtuse. Flowers white or slightly pink, much longer than the involucre, slightly sweet-scented. (P) Europe, Asia as far as Siberia, North Africa, Australia. April-October. *Malta*, at San Antonio Gardens and other old gardens, naturalised on walls, fissures of pavement etc. E. Hempweed, Water Agrimony. I. Canapa acquatica.

## TRIBE II-SENECIOIDEAE.

Ray florets female and ligulate or rarely filiform, disk florets hermaphrodite or rarely male by abortion of the gynaecium. Receptacle naked or hairy. Pappus hairy.

### SENECIO (Tourn.) L.

Heads in corymbs, rarely solitary, almost always with ray florets ligulate. Involucre cylindrical or campanulate, with one series of scales, often with smaller scales at the base. Receptacle naked and flat. Flowers yellow or orange; ray-florets female, almost always ligulate; disk florets hermaphrodite, tubular, 5-toothed. Achenes cylindroid, angular or furrowed, often pubescent, not finishing in a beak. Pappus made of several series of caducous hairs, hardly scabrous. Includes about 1,200 species, distributed in all countries.

**SENECIO VULGARIS L.** Plant annual, glabrous or cobweby, fleshy, with erect stems 1-4 diameter high. Lower leaves oblong or spatulate, toothed, with a short petiole; upper leaves pinnatifid, with obtuse and toothed lobes, amplexicaul at the base. Heads in corymbs, pendulous before flowering. Involucre cylindrical 5-7 mm long, with shining acute bracts, black at the tip and with many lanceolate scales at the base, also tipped black and imbricate. Achenes with very short pubescence. (A) Europe, North Africa, Western and Northern Asia; naturalised in South Africa, Abyssinia, Australia and America. December-May. *Malta*, *Gozo* and *Comino*, common in fields, gardens and valleys. E. Common Groundsel. I. Calderugia, Virzellina, Solleciola. M. Cubrita, Haxixa tal Canali.



In the form: *sordidus* Peterm., common in fields and exposed situations, the plant is more cobweby and wooly. In the form: *radiatus* Kock, frequent especially late in the season, the ray florets are short and spreading.

**SENECIO GALLICUS** Chaix in vill. Plant annual, glabrous or somewhat hairy, with a stem 1-4 diameter high. Leaves fleshy, deeply divided into linear lobes, with are divergent and almost always toothed or pinnatifid, with revolute margin. Flowers in loose corymbs; heads 12-15 mm long, with 1 or 2 secondary scales at the base, sometimes with 4-5 scales in the form: *laxiflorus* Viv. Ligulate flowers yellow. Achenes shortly pubescent. (A) England, France, and western part of the Mediterranean region. December-May. Gozo, very rare, near Chambray, according to Gulia-*Senecio squalidus* All. Non L.

**SENECIO LEUCANTHEMIFOLIUS** Poir. Plann annual, usually met with along the sea-coast, glabrous or slightly hairy, 2-30 cm high, with a bushy habit, or with prostrate or ascending stems. Radical leaves obovate, petiolate and toothed, the others variously divided, sessile, amplexicaul, with two wings at the base. Flowers in a loose corymb; heads small, with involucre 5-6 mm long, and with 8-10 scales at the base. Ligules yellow, about as long as the involucre. Achenes slightly pubescent. (A) Mediterranean region. March-April. The typical form, having a green plant, usually prostrate, with fleshy leaves, amplexicaul or petiolate, is met with in *Malta*, at Ghar Hasan, Fort Manoel, Hagra tal General, etc., but is rare. In *Gozo*, it is also scarce, at Cala Dueira, Ta Cenc, Ras san Dimitri, Xlendi. It is frequent in *Comino*.

Var. *vernus* Biv.-*Senecio vernalis* Raf.-*S. apulus* Ten. Plant rather glaucous and vigorous. Leaves not fleshy. Subsidiary scales almost entirely black, the involucral scales black at the apex. With the type in *Malta*, *Gozo* and *Comino*; sometimes met with away from the sea.

Var. *pygmaeus* D.C. Plant very dwarf, hardly exceeding 10 cm in height, mostly prostrate, with fleshy leaves, the lower spatulate, the upper more or less linear, toothed or lobed. Heads small, solitary at the end of the stems, with the ray florets not ligulate. Often considered as a distinct species. On walls and shaded localities not far from the sea. February-April. Rather frequent in *Malta*, *Gozo*, *Comino*, *Cominotto* and *Filfolà*; also found in Lampedusa and at Capo Pasaro in Sicily.

**SENECIO CINERARIA** D.C. Plant perennial, suffruticose, bushy, with stiff erect or ascending branched stem, usually ashy-white or silvery-white, 3-10 diameter high. Leaves fleshy and more or less coriaceous, alternate, petiolate, without wings at the base, pinnatifid or pinnatilobed, with 3-fid lobes, snowy white on the under surface, ashy green or powdery or snowy white on the upper surface. Flowers in a large branched corymb, golden yellow; involurcre without secondary scales, or with a few minute scales. (P) South europe; naturalised in North America. May-July. Common in fissures of rocks and cliffs in *Malta*, *Gozo*, *Comino*, *Cominotto*, *Selmun*, *Filfolà*, especially in places not far from the sea, but found also inland at Wied Encita, Musta, Wied Kerda etc. E. Sea Ragwort. M. Cromb il bahar.-*cineraria maritima* L.-*Senecio*

maritimus Rehb. non L. f. The form: *ceratophyllus fiori*-*Cineraria ceratophylla* Ten. with pinnatifid leaves and narrow segments snowy white on both surfaces, is met with at Ahrax and Majesa.

Var. *bicolor* Tod.-*Cineraria bicolor* W. Leaves deep green and glabrous on the upper surface, or hardly powdery, with broad segments entire or slightly toothed, the terminal segments confluent in a large lobe more or less deeply toothed. *Malta*, Wied Encita, St. Paul's Bay, Wardia. Gozo, Xlendi and Migiarro.

Var. *ambiguus* D.C.-*Cineraria ambigua* Biv. Leaves lyrate-sinuate or lyrate pinnatifid, the terminal lobes confluent in a large lobe, ashy green and glabrous or powdery on the upper surface, tomentose white on the lower surface, with almost glabrous involucre. *Malta*, at Wardia and St Paul's Bay.

### TRIBE III-ASTEREAE.

Ray florets female or neutral, ligulate or filiform; disk florets hermaphrodite. Receptacle naked. Pappus hairy, rarely scaly, or rudimentary or wanting. Leaves alternate. Ray ligulate florets rarely wanting.

### BELLIS (Tourn.) L.

Heads solitary, all with ligulate ray florets. Involucre campanulate, with 1-2 series of oblong leafy scales all of the same size. Receptacle alveolate, conical. Ray florets female, in one series, ligulate, white or red. Disk florets hermaphrodite, tubular, yellow, with 4-5 teeth. Achenes obovate, compressed, more or less hairy, without pappus, or rarely with rudimentary pappus. Includes 5 species, natives of Europe and the Mediterranean region.

BELLIS ANNUA L. Plant annual, with stems leafy below, or rarely almost stemless, slightly hairy or hispid. Stem branched or simple, 5-15 cm high. Leaves obovate or spatulate, toothed or almost entire, with a winged petiole; upper leaves very small. Ligules white, rarely rosy, twice as long as the involucre, hairy at the base. Achenes somewhat hairy (A) Mediterranean region and Madeira. December-April. *Malta*, Gozo and Comino, very common everywhere. The form: *dentata* D.C.-*Bellium dentatum* Viv., with toothed leaves, and bearded ligules with jointed hairs, is met with usually in gardens and shaded localities.-*Bellium bellidioides* Desf. non L. E. Annual Daisy. I. Occhio di pupa. M. Bebuja.

In dry and exposed localities the plant is dwarf, often with only one head (for: *monocephala* Nicotra). In more sheltered situations and on better soils, the plant may become much branched and bushy in habit. Or with many prostrate stems, or with stems thickened at the base so as to simulate *Bellis perennis* L., and its variety, *hybrida* Ten., which are cultivated in gardens, but do not exist wild anywhere in these Islands.

BELLIS SILVESTRIS Cyr. Plant perennial. Leaves rosulate, oblong-spathulate longish, crenate or entire, with a winged petiole; leaves and flower-stalks all radical, and more or less hairy or hispid. Flower-heads borne on long radical peduncles, 3-4 cm in diameter, with acute involucre scales 7-10 mm long. Peduncles 2-3 diameter long. Ligules white or often rosy on the outside or entirely pink. Achenes 2mm long, very hairy. (P) Mediterranean region. September-March. Frequent on uncultivated wastes in *Malta*, *Gozo* and *Comino*. E. Portugal Wood Daisy. I. Margherita autunnale. M. Margherita salvagga.-doronicum Bellidiastrum Sm. Non L.

The form: pappulosa Boiss.-Bellium pappulosum Kze. With achenes having a short scaly pappus, is met with in the Boschetto and Wied Encita and probably elsewhere. The form: verna N. Terr., with very tomentose peduncles not more than 6 cm long, is frequent on the glaciis at Floriana and in exposed situations near Boschetto and Ta Laurenti.

## ERIGERON L.

Heads in corymbs or solitary. Receptacle somewhat convex. Ray florets female in several series, rarely in one series, ligulate and white or pink, or the outer ligulate and the inner filiform, or all filiform. Disk florets hermaphrodite or male by abortion, tubular, 4-5 toothed. Pappus bristly and scabrous, usually 1-seriate. Achenes oblong, compressed, pubescent. Includes about 250 species, of which about one half are natives of North America, the remainder being broadly distributed all over the world.

ERIGERON CRISPUS Pourr. Plant annual, ash-coloured and hirsute. Stem erect, usually simple, or branched from the base, terminating in a large corymbose panicle, 3-9 diameter high. Radical leaves rosulate, sparsely but deeply toothed; cauline leaves dense, oblong-lanceolate, petiolate, sparsely but deeply toothed; the upper leaves being linear, entire and sessile; all with a more or less crisp or wavy margin. The whole plant is densely pubescent, having also long spreading hairs. Ray florets all filiform, whitish, without ligule. Hermaphrodite flowers limited to 5 or 6. Involucre 4-5 mm long. Achenes hardly pubescent, with a pappus becoming usually reddish at maturity. (A) Mediterranean region, Madeira, Canaries, Cape Verde islands; naturalised elsewhere. Flowers almost all the year, but commonly in May-July. *Malta*, *Gozo* and *Comino*, very common in fields, gardens, along roads, etc.-*Erigeron linearifolius* Cav.-*conyza ambigua* Moris. E. flea-bane, colt's tail. M. Zghazigha salvagga.

Usually mistaken for *Erigeron canadensis* L. by the older Maltese botanists.

## TRIBE IV-ANTHEMIDEAE.

Heads with ray florets female or rarely neutral, ligulate or tubular, and with disk florets tubular and hermaphrodite or male owing to abortion of gynaecium, or both ray and disk florets tubular and hermaphrodite.

Receptacle naked or furnished with scales or hairs. Pappus wanting or reduced to a ring or membranous scale. Leaves alternate.

### MATRICARIA (Tourn.) L.

Heads more or less in corymbs. Involucre campanute with imbricate scales, scarious at the apex and along the margin. Receptacle ovoid or conical. Ray florets female, in one series, ligulate, white, sometimes wanting: disk florets hermaphrodite, tubular, yellow, 4-5 toothed. Achenes cylindroid or angular, without pappus, or with a fringed scale. Includes about 50 species, mostly natives of Europe and the Mediterranean region as far as India, and of South Africa.

MATRICARIA AUREA (L.) Bois. Plant annual, glabrous, often branched from the base; with erect stems 8-15 cm high, with few flower-heads. Leaves pinnatifid, with short setaceous segments, entire or lobed. Heads without ligulate ray florets, on a long and slender peduncle, more or less pendulous. Receptacle ovate. Achenes very small, slightly curved, keeled on the outer side and with 3 ridges on the inner side. (A) Mediterranean region and India. March-May. *Malta*, rare, on the glacis of Floriana from Porte-des-Bombes to Gas Works. *Gozo*, rare, at Gran Castello-cotula aurea L.-*Anthemis aurea* Webb.-*Anacyclus aureus* Lam.-*Chamomilla aurea* J. Gay.

MATRICARIA CHAMOMILLA L. Plant annual, aromatic, glabrous. Stems branched from the base, erect or ascending 1-5 diameter long. Leaves sessile, bipinnatifid, with linear setaceous spreading segments, flat on the under surface. Heads with ligulate ray-florets, in corymbose panicle, 13-22 mm in diameter on long peduncles. Ligules white, becoming reflexed, receptacle conical-oblong, hollow within. Achenes smooth on the dorsal side, with 5 ridges on the ventral side, with or without ring. (A) Europe, Western Asia, Siberia, Algeria India, Canaries; naturalised elsewhere. *Malta* and *Gozo*, in old gardens, on heaps of rubbish, etc frequent at the Marsa, but not common; often cultivated for use in domestic medicine.-*Chamomilla officinalis* C. Kock.-*Leucanthemum Chamaemelum* Lam. The form: *suaveolens* L. with smaller flowers, and achenes not furnished with ring, is also met with wild or half-wild. E. Chamomille, Gowan. I. Camomilla. M. Camumilla.

### CHRYSANTHEMUM (Tourn.) L.

Heads solitary or in corymbs, with or without ligulate ray florets. Involucre campanulate, imbricate, with scales scarious along the margin. Receptacle convex or hemispherical. Ray florets female, or rarely neutral, ligulate, white or yellow, or tubular 3-4 toothed, or wanting. Disk florets hermaphrodite, tubular, 5-rarely 4-toothed, yellow. Achenes similar or dissimilar, cylindrical, angular, or 2-3 winged, naked or with a membranous ring variously cut. Includes about 140 species natives of the northern hemisphere.

CHRYSANTHEMUM SEGETUM L. Plant annual, glabrous, glaucous-green, with an erect or prostrate stem 1-6 diameter high. Branched and corymbose,

with branches terminating in one head. Lower leaves toothed or pinnatifid, cuneate at the base, petiolate; the other toothed or trifid, or almost entire amplexicaul. Heads 2-5 cm in diameter, on peduncles thickened at their insertion. Involucral scales unequal, roundish, scarious along the margin and apex. Ligules obovate or oblong, golden yellow. Ray achenes with two outer angles winged; disk achenes cylindrical with 10 equal ridges. (A) Mediterranean region, Central Europe as far as the Caucasus; naturalised in North America and South Africa. March-April. In fields and valleys, rather uncommon. *Malta*, Marsascala, Zeitun, Notabile, Wied Encita, Boschetto, Corradino, Ghirghenti, Ghain il Cbira. *Gozo*, also uncommon, at Xlendi and Ramla.-*Xanthophthalmum segetum* Sz Bip. E. Boodle, Wild Marigold. I. Ingrasabue. M. Zigland or Lellux.

**CHRYSANTHEMUM CORONARIUM L.** Plant annual, glabrous. Stem erect, branched, 2-6 diameter high, densely leafy. Leaves all bipinnatifid; the lower narrowed at the base, the upper amplexicaul, of an oblong shape, with acutely toothed lobes. Heads 3-5 cm in diameter, on peduncles thickened at their insertion; involucral scales u.s. with rust-coloured margin. Ligules yellow. Ray achenes with 3 angles winged; the disk achenes tetragonous-compressed, winged along the inner angle: all achenes glandular and striated. (A) Mediterranean region, Madeira, Canaries, Azores, January-June. *Malta*, *Gozo* and *Comino*, very common in fields and on uncultivated wastes.-*Pinardia coronaria* Less. E. Crown Daisy. I. Bambagella, Fior d'oro. M. Zigland, Lellux.

The form: *albo-radiatum* Welw. Has yellowish white ligules. The form: *bicolor* Micheletti, has ligules yellow at the base, white or cream towards the apex. The form: *tubulosum* mihi, has long tubular deep yellow ray florets, and is frequent at Notabile.

**CHRYSANTHEMUM LEUCANTHEMUM L.**, especially the variety, *maximum* Ram., and *Ch. Parthenium* (L) Bernh. Are often cultivated and naturalised in old gardens, on heaps of rubbish etc., but are really garden escapes. *Chrysanthemum indicum* L. and *Ch. Vulgare* (L) Bernh. Are also common in gardens, but are not met with self-sown.

#### ARTEMISIA (Tourn.) L.

Head small, more or less globose or oblong, in racemes or spikes forming panicles. Ray florets not ligulate. Involucre made of several series of imbricate scales, scarious at the margin. Receptacle flat or conical, hirsute or naked. Flowers yellow, or reddish or greenish. Ray florets female, in one series, sometimes wanting, tubular, 3-toothed. Disk florets hermaphrodite or male by abortion of gynaecium, tubular, 5-toothed. Achenes fusiform or obovate, naked and smooth. Includes about 200 species, native mostly of the northern hemisphere.

**ARTEMISIA ABSINTHIUM L.** Plant perennial or with perennial rootstock, herbaceous, with an intensely bitter taste. Stems 2-10 diameter high. Lower leaves tripinnatifid, tomentose-whitish, with linear-oblong lobes. Panicle

pyramidal, long and broad, but loose. Heads globose, 3-5 mm in diameter. Receptacle hairy; ray florets hermaphrodite, all fertile. Achenes not glandular. (P) Mediterranean region, Europe as far as Siberia, Western Asia, naturalised elsewhere. June-September. Originally naturalised in Ta Braxia Cemetery and neighbourhood whence it has spread to many gardens in *Malta* and Gozo, at first cultivated but soon becoming naturalised-Absinthium vulgare Lam. E. Wormwood. I. Assenzio M. Assensiu.

ARTEMISIA ARBORESCENS L. and A. camphorata Vill. Are frequently cultivated and are met with in neglected gardens and near farmhouses, but are rarely found self-sown.

#### ANTHEMIS L.

Heads solitary or in corymbs, with ligulate ray florets, rarely without them. Involucre campanulate; with a few series of ligulate scales, scarious along the margin. Receptacle convex or conical, furnished with membraneous scales. Ray florets female, or rarely neutral, ligulate, with long ligules, white or yellow, rarely wanting, disk florets hermaphrodite, tubular, 5-toothed, whitish or yellow. Achenes obconical, compressed or angular, grooved or striated, naked or with a membraneous ring, entire or not. Includes about 100 species, natives of Europe as far as Siberia, only one being native of Abyssinia; often naturalised elsewhere.

ANTHEMIS MIXTA L. Plant annual, pubescent or villous, slightly scented, with erect stems often branched from the base, or almost decumbent, 5-30 cm high. Lower and middle leaves spathulate, bipinnatifid, with linear mucronate segments; the upper leaves linear, longer and pinnatifid, all with a broad rachis. Heads about 2 cm in diameter, with oblong obtuse scales. Ray florets with white ligules, yellow at the base, and sterile: disk florets with a winged tube, with a spur-like prolongation at the base. Receptacles becoming very conical, with linear-lanceolate, acute and keeled scales. Achenes naked, smooth on the outer side. (A) Mediterranean region, Canaries; naturalised elsewhere. March-May. *Malta*, rare, at Gzira and St Julians. *Ormenis mixta* D.C.-*O. bicolor* Cass.-*Maruta mixta* Moris.-*Matricaria mixta* Gr. Et Godr.

ANTHEMIS COTULA L. Plant annual, fetid, only slightly hairy. Stems erect or spreading. Leaves oblong, bipinnatifid, with linear mucronate segments, and narrow rachis. Ray florets, ligulate, white, sterile, and without style. Receptacle conical, with linear scales in its upper part. Achenes striated, furnished with tubercles, naked, reddish yellow or whitish. (A) Europe, Mediterranean region, Abyssinia and Siberia; naturalised elsewhere. March-June. *Malta*, rare, in fields and gardens, Marsa, Sliema, Floriana Glacis, Pieta etc.

The form: *psorosperma* Ten., with closer leaf segments, longer peduncles, and whitish seeds heavily glandular, is also met with at Pieta and Floriana.-*Maruta Cotula* D.C.-*M. foetida* Cass.-*Anthemis foetida* Lam.

**ANTHEMIS FUSCATA** Brot. Plant annual, glabrous or almost glabrous, aromatic. Stems erect or ascending, branched 5-30 cm high. Leaves with broad rachis, bipinnatifid, with short segments, not mucronate. Heads about 2 cm in diameter, with oblong obtuse scales with rusty margin becoming reflexed. Receptacle conical, with oblong obtuse scales, which are persistent only on the lower part of the disk. Ray florets sterile, without style; ligules white, yellow at the base. Achenes obovate, angular, naked (A) South and Western Europe, North Africa. March-June. *Malta*, on the glacis and ditches outside Porte-des-Bombes.-*Anthemis praecox* Lk.-*A fallax* w.-*Maruta fuscata* D.C.-*Perideraea fuscata* Webb.

**ANTHEMIS PEREGRINA** L. Plant annual, whitish hairy and tomentose. Stems bushy or spreading 1-2 diameter long. Leaves fleshy, petiolate, oblong, pinnatifid with linear or cuncate segments simple or trilobed. Peduncles becoming enlarged at their insertion. Heads 2-3 cm in diameter, with outer scales triangular, the inner oblong and scarious at the margin. Receptacle slightly conical, with keeled and mucronate scales. Achenes with very short crown, the outer quadrangular or grooved, the inner striated. (A) South Europe and Asia Minor. April-May. *Malta*, in sandy places close to the sea, at Sliema; according to Delicata and Gulia.-*Anthemis tomentosa* Ten. non L.

**ANTHEMIS ARVENSIS** L. Plant annual, biennial or perennial, hairy or pubescent, scentless; stems bushy, branched, 1-5 diameter high, or prostrate. Lower leaves oblong, petiolate, pinnatifid or bipinnatifid, with linear or capillary segments, which are acute or mucronate. Petioles furnished with lateral segments. Heads 1-4 cm in diameter on long slender peduncles; involucre hairy, with acute outer scales, the outer obtuse and scarious at the apex. Ray florets fertile, ligulate, white. Receptacle conical, with rigid keeled mucronate scales. Ray achenes much larger, quadrangular; disk achenes conical angular; all smooth. (A), (B), (P) Europe and the whole Mediterranean region; naturalised in North America. March-May. Common in fields and on waste ground in *malta*, *Gozo* and *Comino*.-*Anthemis agrentis* Wallr.-*A. chia* Groves non L. e. Corn Chamomile. I. Camomilla bastarda M. Bebuna.

Var. *incrassata* Lois. Plant annual, with prostrate stems, and more or less curled leaves. Peduncles club-shaped at their insertion, when in fruit. Frequent with the species and often entirely supplanting it. The form: *sicula* Guss., with normal flowers, and plant villous-pubescent and ashy green; and the form: *Gemellari* Tin., with small flowers, and plant more branched, very pubescent and whitish, are also met with.

**ANTHEMIS SECUNDIRAMEA** Biv. Plant annual, glabrous or almost glabrous; stems prostrate, ascending or erect, with a petiole furnished with segments at the base. Peducles naked above and thickened at thir insertion. Heads of middling size; receptacle hemispherical or conical, furnished with keeled mucronate rigid scales. Achenes furnished with a very narrow toothed ring. (A) South Europe and North Africa. March-June. The typical form has not been met with in the Maltese Islands.

Var. *Urvilleana* D.C.-*Anthemis maritima* Urv. Non L.-A. *Urvilleana* Sommier et Caruana-Gatto-A. *secundiramea* var. *robustior* Nym. Leaves often without segments at the base of the petiole. Peduncles often leafy along their base of the petiole. Peduncles often leafy along their entire length. Plant smaller, rigid and bushy. Ligulate flowers few, often reduced to 5. Scales of receptacle shorter and more obtuse. (A) Common in rocky localities close to the sea, in *Malta*, *Gozo*, *Comino*, *Selmun*. A very distinct and endemic variety, possibly identical with var. *cosyrensis* Guss. of Pantelleria. M. Bebuta.

## ANACYCLUS L.

Tube of corolla compressed, and winged on each side. Ray achenes compressed, surrounded by a broad wing, which is prolonged upwards on each side into an auriculate process, continuous with a cleft ring. The rest as in *Anthemis*. Includes about 12 species, natives of the Mediterranean region.

**ANACYCLUS RADIATUS** Loiss. Plant annual, pubescent and villous, with an erect rigid stem, or decumbent, 1-6 diameter high. Leaves oblong, bipinnate, with linear segments mucronate or spinescent; the upper leaves sessile, the lower with a petiole furnished with awl-like segments. Peduncles short; heads up to 4 cm in diameter, with a villous involucre having the inner scales broad at the apex, prolonged into a scarious fringed appendix. Ray florets with yellow ligules, rarely without ligules. Receptacle broadly conical, with cuneate scales terminating in a short point. Achenes cuneiform, the outer more broadly winged. (A) Mediterranean region. April-June. *Malta*, rare; at St. George's Bay, and Ghain Duieli. The form met with at Ghain Duieli is the typical one with ligulate golden yellow ray florets; the form met with at St. George's Bay is form: *pallens* Guss in which the ligules are sulphur yellow.

**ANACYCLUS CLAVATUS** (Desf.) Pers. Plant annual, usually branched from the base, more or less prostrate or ascending, glabrous below. Peduncles somewhat clavate below the heads. Inner involucre scales without a scarious appendix. Ray florets with white ligules, rarely without ligules. Scales of receptacle not ciliated; the rest u.s. (A) South Europe, North Africa, the Canaries.-*Anthemis clavata* Desf.

Var. *tomentosus* D.C.-*Anthemis tomentosa* Gouan. non L. Scales of receptacle ciliated at the apex. Plant more or less vilous. Heads with well developed white ligules. June-July. *Malta*, very rare, at the Poor House and in the neighbourhood of Casa Luca. The plants referred to belong to the form: *pubescens* Rehb.-*Anthemis pubescens* W-Anacyclus *clavatus* var. *marginatus* Guss., in which the involucre scales are margined brown.

## ACHILLEA L.

Inflorescence corymbose; heads small with ligulate ray florets. Involucre campanulate or ovoid, with imbricate scales; receptacle flat or conical, with oblong transparent scales. Ray florets female, ligulate, with short roundish white, yellow or purplish ligules. Disk florets hermaphrodite, tubular, 5-



toothed. Achenes oblong, glabrous, compressed, naked. Includes about 80 species, natives of temperate regions of the northern hemisphere.

**ACHILLEA MILLEFOLIUM L.** Plant perennial, with rootstock, slightly sweet-scented, dark green. Stems angular, erect, simple or branched, 1-10 diameter high. Leaves long, linear, bipinnatifid, with short segments, mucronate at the apex. Radical and lower leaves petiolate, the others sessile, Corymb large and dense. Involucral scales oblong, with a rusty or clear scarious margin. Ligules white, yellowish or purplish; disk florets white or pink. (P) Europe, Western Asia as far as Siberia, and North America. May-July. Cultivated in gardens: naturalised in Gozo, near farmhouses at Xlendi. The plant cultivated and naturalised belongs to the form: collina Becker, with rigid leaves silky or villous, densely cut into short segments and flowers with white ligules. E. Common Milfoil, Yarrow. M. Haxixa tal morliti.

#### EVAX Gaertn.

Heads without ligulate ray florets, sessile, or in terminal clusters. Involucre with 2 series of scarious scales, of same shape, gradually transforming into the scales of the receptacle. Receptacle conical, naked at the apex. Ray florets in several rows, female, filiform, 4-toothed, each in the axil of a scale; central florets few and male, tubular or obconical, 4-toothed, yellow. Stamens 4, with anthers prolonged at the base on each side into a tail-like process. Achenes compressed, obovate, naked. Includes about 15 species, of which 11 are natives of the Mediterranean region, and 4 are natives of North America.

**EVAX PYGMAEA (L.) Pers.** Plant annual, very dwarf, very tomentose, white or ashy white, with a simple stem, or branched at the base or under the central flower-cluster, 1-5 cm high. Leaves sessile, dense, spatulate, obtuse, entire: floral leaves 2-3 times as long as the head, and rosulate. Heads oval, in terminal clusters. Involucral scales scarious, ovate, tomentose below, yellowish and recurved at the apex. Achenes scabrous. (A) Mediterranean region, Canaries. March-May. Common in arid and rocky localities in *Malta*, *Gozo*, *Comino*, *Cominotto* and *Selmun*. –*Filago pygmaea* L.-*Micropus pygmaeus* Desf.-*Evax umbellata* Gaertn.

#### FILAGO L.

Heads without ligulate ray florets, usually sessile and united in clusters. Involucre with 3-5 series of scales similar to the scales of the receptacle. Receptacle variable, flat or elongated and filiform. Ray florets in several rows, female, filiform, each in the axil of a scale. Central or disk flowers few, hermaphrodite, tubular, 4-5 toothed. Anthers u.s. Achenes obovate-compressed, the inner ones always with pappus of scabrous bristles. Includes 12 species mostly natives of Europe, Asia and North Africa.

**FILAGO GERMANICA (L.) L.** Plant annual tomentose, white, or ashy, or yellowish, branched at the base or higher up, with erect or prostrate stems, dichotomously branched 5-30 cm long. Leaves entire, oblong, spatulate, or linear-lanceolate, dense. Inflorescence in globose clusters of 2-20 heads,

terminal or at the bifurcations of the branches. Heads sessile, with 5 series of involucre scales, the outer acuminate-aristate. Receptacle elongated, or club-shaped or filiform. Outer achenes naked, the central furnished with pappus (A) Europe, Asia as far as Siberia, North Africa, Abyssinia, Canaries; naturalised in North America. E. Down-weed- *Gnaphalium germanicum* L.-*filago vulgaris* Lam. A very variable species. April-May. Common in valleys, along roads, and on rocky and uncultivated ground in *Malta*, *Gozo* and *Comino*. The following varieties or subspecies are met with.

Var. *spathulata* Presl. Plant more or less erect, or partly prostrate, whitish and tomentose or greenish tomentose. Heads in clusters of 10 to 15, u.s. Involucre scales yellowish, terminating in a short recurved awn.-*filago pyramidata* L.-F. *Jussiaeae* Coss. et Germ.

The typical variety is rare: *Malta*, Wied il ghasel, Boschetto. *Gozo*, Imgiar ix-Xini, in shaded localities. The form *decumbens* Gib. et Pir., with prostrate or partly prostrate and decumbent stems is common.

Var. *prostrata* Parl. non D.C. Plant often bushy, but with prostrate slender stems, densely leaved. Leaves almost linear; involucre leaves not longer than the heads. Plant usually greyish white, or white, and silky. April-May. *Malta*, *Gozo* and *Comino*, frequent in exposed and dry situations.-*Filago affinis* Tin. ex Guss.

Var. *Gussonei* Lojac. Plant u.s. densely bushy-tomentose and white, with shorter leaves, and reflexed or spreading involucre scales. April-May. Common u.s. especially in the southern and western part of *Malta*.-*Evax tenuifolia* Guss.-*Filago cosyrensis* Lojac.

#### HELICHRYSUM (Vaill) Gaertn.

Heads without ligulate ray-florets, in corymbs, rarely solitary. Involucre scales in many series, entirely or almost entirely scarious. Florets all hermaphrodite, or with only one row of female ray-florets. Anthers caudate at the base on both sides. Achenes oval-cylindrical, with a pappus made of bristles often plumose at the apex. Includes about 300 species, natives of the eastern hemisphere.

HELICHRYSUM INODORUM (Desf.) Fiori. Plant perennial, heavily tomentose with long hairs, inodorous, bushy, with annual stems, woody at the base, erect or ascending 1-6 dm long, densely tomentose. Leaves linear or linear-lanceolate, obtuse, whitish and tomentose on both surfaces. Involucre external scales oval or oblong, entirely scarious, the internal are more elongated and always glabrous. Female ray-florets few. Achenes minutely papillose. (P) Mediterranean region. May-June.-*Gnaphalium Stoechas* var. *inodorum* Desf.

Var. *rupestre* D.C. often described as a distinct species. Plant robust, stems rigid and often angular. Leaves linear or almost linear, revolute at the margin, always longer than 3 cm. Corymb more or less umbel-shaped, heads 4-5 mm

in diameter, pointed before flowering; involucre shining golden yellow. *Malta*, rare, at Wied Babu; *Gozo*, also rare, on rocks round Dueira and on Hagra tal General.-*Gnaphalium rupestre* Raf.-*Helichrysum rupestre* D.C.-*Gnaphalium Fontanesii* Camb.-*g. orientale* Zerapha non L. I. Elicriso, Solfino, Semprevivo. *M. Sempreviva salvagga*.

#### PHAGNALON Cass.

Heads without ligulate ray florets, solitary or grouped in clusters on a long peduncle. Involucre almost cylindrical or campanulate, with imbricate scales coriaceous or scarious. Receptacle flat and naked. Flowers yellowish; the outer, female, in several rows, 3-toothed, hairy, often abortive; the central hermaphrodite, 5-toothed, fertile. Achenes villous, almost cylindrical, furnished with pappus made of one series of scabrous bristles. Includes about 20 species, natives of the Mediterranean region as far as Tibet and the Himalaya, Western Europe and the Canaries.

PHAGNALON RUPESTRE (L.) D.C. Plant perennial, bushy 10-25 cm high, with silvery tomentose stems. Lower leaves oblong-spathulate, crisp and wavy along the margin, more or less toothed, rarely linear and entire like the upper leaves, silvery tomentose on the lower surface, slightly tomentose, cottony or even glabrous or ashy green on the upper surface. Peduncles very long, often geminate, bearing only one head. Outer involucre scales ovate or elliptical, obtuse, closely applied, flat, with a scarious margin; inner scales narrower. (P) Mediterranean region, Arabia, Persia, Canaries. April-May.-*Conyza rupestris* L.-*C. tomentosa* Forsk. I. Scuderi. *M. Lixca*.

Var. *Tenorii* Presl. Outer involucre scales very closely applied, and very obtuse, brown, dirty yellow on the sides.-*Conyza geminiflora* Ten.-*C. Tenori* Spr. *Malta*, *Gozo*, *Comino* and *Cominotto*, rather frequent in rocky and stony localities, on walls and in arid places. The form: *fuscescens* Fiori, with plant of reduced dimensions, very narrow leaves, wavy and brownish, and dark brown outer scales, is met with at Wied Encita, Boschetto, Dingli, Xlendi, ta Cenc and probably elsewhere.

Var. *graecum* Boiss. Outer involucre scales less closely applied, narrower and less obtuse, sometimes toothed, the inner narrower and acute.-*Conyza saxatilis* S. et S. non L.-*C. rupestris* Ten. *Malta*, *Gozo* and *Comino*, frequent in valleys, arid and stony localities etc.

#### INULA L.

Heads mostly in corymbs with ligulate ray-florets. Involucre made of several rows of scales, the outer often green, the inner narrower and scarious. Receptacle flat. Flowers yellow; ray florets ligulate, female, in one row; disk florets hermaphrodite, 5-toothed. Base of anther prolonged on each side into a lacinated appendix. Achenes more or less prismatic; with a pappus made

of one series of scabrous or barbed bristles, of same size, free or slightly connate at the base. Includes about 90 species, natives of the Old World.

**INULA CRITHMOIDES L.** Plant perennial, woody at the base; stem suffruticose erect or ascending, branched, 3-9 diameter high. Leaves succulent, smooth and glabrous, sometimes incrustated with an exudation, sessile, linear lanceolate, obtuse or slightly acuminate, entire or slightly toothed at the apex. Heads solitary, on axillary peduncles which are scaly, and thickened at the apex. Involucral scales linear-acuminate, dark green, scarious and yellowish on each side. Ligules yellow, twice as long as the involucre. Achenes hirsute. (P) Mediterranean region and Western Europe. June-November.-*Senecio crithmoides* Scop.-*Limbarda crithmoides* Dum. Common in moist and rocky places along the sea-shore or not far from the sea, in *Malta*, *Gozo*, *Comino*, *Cominotto*, *Gzejjer ta Selmun*, *Filfolja*, *Hagret il General*. E. Golden Samphire. M. Xorbett, Xerbett or Xorbeb.

**INULA GRAVEOLENS (L) Desf.** Plant annual, glandular and viscid, with short hairs and strongly scented. Stem erect, much branched pyramidally, 2-6 diameter high. Leaves all acute, the lower petiolate lanceolate slightly toothed, the upper shorter, linear, entire. Heads small, on short peduncles, grouped in racemes, forming a large pyramidal inflorescence. Involucral scales linear acuminate, green, whitish and scarious along the sides. Flowers at first yellow, then reddish. Achenes hairy or hispid. (A) Mediterranean region as far as India, Central France. September-October. *Malta*, *Gozo* and *Comino*, very common in fields after harvest; met with also along roads and on uncultivated land-*Erigeron graveolens* L.-*Cupularia graveolens* Gr. et Godr.-*Solidago graveolens* Lam.-*Pulicaria graveolens* Nym. The form: *barrelieri* Ten. with broader and toothed leaves, and sessile heads forming short racemes, be frequent with the species. E. Flea-bane. I. Fulichi. M. Zghazigha. The plant is used by country people to drive away mosquitoes and fleas.

**INULA VISCOSA (L.) Ait.** Plant perennial, suffruticose, woody at the base, with a large bushy habit. Stems erect, very leafy, branched above, 4-15 diameter high. Leaves very viscid especially on the lower surface, toothed or entire, amplexicaul and winged at the base. Heads in racemes, forming a large oval inflorescence. Scales of involucre in several series, acute, green, whitish or scarious on the sides. Achenes hirsute. (P) Mediterranean region, Madeira, Canaries. July-November. *Malta*, *gozo* and *Comino*, common in valleys, and along roads and on uncultivated ground in moist localities.-*Erigeron viscosum* L.-*Cupularia viscosa* Gr. et Godr.-*Solidago viscosa* Lam.-*Pulicaria viscosa* Cass. E. Large Flea-bane. I. Cepittoni. M. Tulliera or tolliera.

The following forms are met with; form: *denticulata* Posp. With minutely toothed leaves; and form: *serratifolia* Marchesetti with serrated and more sinuous leaves, (Wied Encita, Boschetto, Ghain il Cbira etc but rather rare); form: *laxiflora* Boiss. with a more loose inflorescence, and heads on longer peduncles, plant rather dwarf and more leafy; also rare, at Xlendi, Kbaijar, Marsalforno (*Gozo*) and at Pualet, Ghain Tuffieha and Gneina (*Malta*).

## JASONIA Cass.

Heads solitary at the apex of the upper branches, forming a panicle or a corymb. Florets all equal, tubular, hermaphrodite, yellowish. Achenes villous, glandular at the apex, furnished with a pappus formed of an outer row of very short bristles, and an inner row of long ciliated bristles. Includes 2 species natives of the western Mediterranean region.

JASONIA GLUTINOSA (L.) D.C. Plant perennial suffruticose, pubescent and viscid, very hairy and woolly when starting fresh growth in the autumn, with a strong scent of camphor, woody at the base. Stems more or less erect and bushy, branched above, 1-5 diameter high. Leaves sessile, small, lanceolate, usually entire, or slightly toothed, wavy along the margin. Involucre campanulate, with linear scales in 2 or 3 series, the outer villous, with a recurved leaf-like process, the inner straight yellowish with a green keel, frayed or bearded at the apex. Achenes pointed at the tip, villous, and glandular at the apex. (P) Southern France, Spain, Portugal, and Lampedusa. May-August. *Malta, Gozo, Comino, Selmun Island*, frequent in fortifications, rocky sides of valleys, old walls and in arid stony localities.-*Erigeron glutinosum* L.-*Jasonia saxatilis* Lam.-*Orsinia camphorata* Bert.-*Chrysocoma saxatilis* D.C. M. *Tulliera salvagga*.

## PULICARIA Gaertn.

Heads with ligulate ray-florets, in terminal corymbs. Involucral scales in several series, the outer green, the inner narrow and scarious. Ligulate florets yellow and female, the central or disk florets tubular and hermaphrodite, 5-toothed. Base of anther caudate and fringed on both sides. Receptacle flat. Achenes cylindroid, ribbed, hairy, pointed at both ends, glandular at the apex. Outer pappus very short, persistent, consisting of a ring of fringed membrane; the inner consisting of long, toothed, very fragile bristles. Includes about 30 species, mostly natives of the mediterranean region, but extending all over Europe and as far as India and Siberia.

PULICARIA DYSENTERICA (L.) fl. Wett. Plant softly tomentose or woolly, more or less whitish, with a strong scent, with a perennial rootstock, suckering freely. Stems erect or ascending, branched above, 2-8 diameter high, without rosulate leaves at the base. Leaves oblong or lanceolate, cordiform at the base and amplexicaul, rugose, wavy at the margin, slightly toothed or entire, tomentose on the upper surface, hairy or villous on the lower surface. Heads forming a large branched corymb, on long peduncles, naked or slightly furnished with bracts. Involucre villous, with linear-acuminate scales. (P) Europe and the Mediterranean region, as far as India. June-October. *Malta*, rather rare, at Boschetto, Marsa and along the road Attard-Notabile-Inula dysenterica L.-*Aster dysentericus* Scop. E. Common Flea-bane. I. *Menta selvatica*, Mentastro.

The plants at Boschetto and along road Attard-Notabile belong mostly to the form: *uliginosa* Stev. In D.C.-var. *microcephala* Boiss., with heads less than 2 cm in diameter, shorter ligules, and plant dwarfer and more branched.

**PULICARIA ODORA** (L.) Rehb. Plant u.s. but slightly dwarfed, and with rosulate leaves at the base of the stems, and more agreeably aromatic. Stems erect, terminating in one to three heads, larger than in the preceding species, 3-4 cm in diameter. Radical leaves petiolate, the cauline sessile, cordiform and amplexicaul u.s., but usually broader and less hairy on the under surface. Peduncles long, naked, thickened at their insertion; pappus of fewer and shorter bristles. (P) South Europe and North Africa. June-October. *Malta*, rather rare, Wied Kirda, marsa, Boschetto, Wied Casal Lia, Wied il Ghasel, Ghirghenti etc.-*Inula odora* L.

The local plants belong mostly to the form: *corymbosa* Fiori.-*Inula Oculus-Christi* Ten. non L., with a corymbose inflorescence, and smaller heads, with less acute involucre scales.

### **ASTERISCUS** (Tourn.) Moench.

Heads solitary or in corymbs, with ligulate ray, florets of a yellow colour. Scales of involucre in several rows, the outer row being foliaceous. Ray florets ligulate, female, in one or two rows; disk florets hermaphrodite, 5-toothed, sometimes with winged tube. Anthers hardly sagittate at the base. Pappus consisting of a toothed or fringed membranous ring. Includes 13 species, natives of the Mediterranean region.

**ASTERISCUS AQUATICUS** (L.) Less. Plant annual, sweet-scented, villous or pubescent, with an erect stem often simple or slightly branched, but on good soils much branched corymb-like, 1-4 diameter high. Leaves oblong-lanceolate, entire, the lower petiolate, the upper sessile and almost amplexicaul. Heads sessile in the bifurcations of the stem, or terminal at the end of the branches, with long bracts. Outer scales of involucre unequal, spreading, hard and whitish at the base; the inner scales coriaceous, whitish. Scales of receptacle acuminate and mucronate. Flowers golden yellow, with ligules just longer than the florets. Achenes silky. (A) Mediterranean region, Canaries. April-June. *Malta*, *Gozo* and *Comino*; in more or less moist localities not far from the sea-shore. Large fine specimens are usually found at Bahar ic-Ciaghak, but is also common at Saline, St. Paul's Bay, Birzebbugia, Ghain Tuffieha, Melleha etc. The form: *nanus* Boiss, with short stems bearing 1-2 heads smaller in size, is frequent at Saline, Bahar ic-Ciaghak, Bugibba, Xlendi, and also in *Comino* and *Cominotto*.-*Buphthalmum aquaticum* L.-*B. melitense* Forskaal-*Odontospermum aquaticum* Sch. Bip.-*Buphthalmum maritimum* Zeraph, *Delicata* etc. E. Ox-eye. M. ghain il Bakra.

The reported presence of *Asteriscus maritimus* Less.-*Buphthalmum maritimum* L., in the Maltese Islands, is evidently due to an error of identification.

**ASTERISCUS SPINOSUS** (L.) Gr. et Godr. Plant villous or woolly, branched from the base, with erect or prostrate or decumbent stems dichotomously branched 1-5 diameter long. Leaves entire or almost entire, the radical more or less spathulate and petiolate, the cauline lanceolate, winged or

amplexicaul. Heads without bracts, all on peduncles, the laterals being higher. Outer involucre scales large, lanceolate, rigid, spreading, often spinescent, with prominent nerves; the inner scales oblong, cuspidate or spinescent, as long as the ray florets. Achenes almost hairy. (A) or (B) Mediterranean region, Western Europe, Canaries. April-June.-*Buphthalmum spinosum* L.-*B. asteroideum* Viv.-*Pallenis spinosa* Cass I. *Astro spinoso*. M. Ghain il Bakra Xeuuekija or Centaurja.

Var. *pallens* Cicioni.-*Pallenis spinosa* var. *pallida* Cicioni. Heads measuring not more than 20 mm in diameter between tips of ligules, which are pale yellow. *Malta, Gozo, Comino, Cominotto, Selmun Island*; common on rocky and uncultivated land, along country roads, walls of fields etc. Frequently used in domestic medicine as a cure of undulant fever.

Var. *aureus* Lge.-*Buphthalmum aureum* Salzm.-*Pallenis aurea* Bym. Heads larger, often twice as large, measuring not less than 25 mm u.s. Ligules golden yellow. Plant more robust, more leafy, but dwarfer, with thicker stems, generally decumbent. *Malta*, not common, on the rocky wastes around Casal Dingli, at Imtahleb and Bahria.

#### TRIBE VI-CALENDULEAE.

Heads with ligulate female ray-florets and with hermaphrodite or sterile tubular disk florets. Anthers sagittate at the base. Style of female flowers cleft, with truncated segments; style of hermaphrodite or sterile flowers simple. Receptacle naked. Pappus wanting. Leaves alternate.

#### CALENDULA L.

Heads solitary, terminal. Involucre scales in two series, subequal and imbricate. Receptacle flat and naked. Ray florets in 2 or 3 series, ligulate, female, fertile; disk florets tubular, hermaphrodite or functionally male, sterile. Achenes in 2 or 3 series, without pappus, the outer narrow and beaked and sometimes wanting; the middle series broad, more or less curved, truncated at the apex, winged at the sides, and tubercled or spinescent on the dorsal side; the inner series narrow, very much recurved, and rugose transversely. Includes two species, both very variable, possibly reduceable to only one species (*C. officinalis* L.), with many varieties and forms more or less distinct, often described as species, natives of Central Europe and the Mediterranean region as far as India, the Canaries; cultivated and naturalised elsewhere.

*CALENDULA ARVENSIS* L. Plant annual with a disagreeable odour, more or less pubescent, or villous, or glandular and viscid. Stems angular, branched, erect or decumbent. Leaves more or less sinuate or wavy, and mostly toothed with mucronate teeth terminating in a black gland, the lower oblong-lanceolate almost petiolate, the cauline winged at the base and amplexicaul. Heads borne on peduncles. Involucre scales lanceolate, acuminate, hairy or scabrous externally, scarious along the margin. Ligulate flowers, measured from base of ovary to tip of ligule, not more than 19 mm long, or not longer than twice the length of the involucre (A) Distribution as above; naturalised in

South America, Australia and Japan. E. Field Marygold. I. Calendula, Fior-rancio, Calta. M. Suffeira.

Var. *arvicola* mihi-Calendula *micrantha* var. *ambigua* Guss. Ligulate flowers up to 15 mm long, measured u.s., sulphur yellow or rarely saffron yellow. Outer achenes furnished mostly with a long beak and winged on the sides; the other achenes rugose, the median being broad, boat-shaped. October-May. Very common in fields, among crops, along roads and on uncultivated ground, in *Malta*, *Gozo* and *Comino*.

Var. *aegyptiaca* Desf. Ligulate flowers not more than 9 mm long, about as long as the involucre. Ray-florets yellow, disk florets purplish. Plant papillose and hirsute, and somewhat viscid. January-may. *Malta*, *Gozo* and *Comino*, in fields and on uncultivated ground, but far less common.

Var. *parviflora* Raf-Calendula *macroptera* Rouy. Ligulate flowers about 14 mm long, not more than twice as long as the involucre, saffron yellow, sometimes sulphur yellow. Beaked marginal achenes furnished on each side with a broad scarious wing, toothed along the margin. February-May. *Malta*, at Imtahleb and neighbourhood. The form: *discolor* mihi.-*C. macroptera* var. *discolor* Rouy, with purplish florets is also met with at Imtahleb.

CALENDULA OFFICINALIS L. Plant perennial, erect or spreading, suffruticose at the base; sometimes annual, but then much developed in all its parts; pubescent or scabrous. Ligulate flowers rarely less than 20 mm long, and often exceeding 30 mm measured u.s., that is twice or thrice the length of the involucre. Outer achenes when present, furnished with a long beak, and have a spinescent ridge on the dorsal side. Plant with the same disagreeable odour, smooth or pubescent or scabrous, but rarely viscid. Leaves more wavy along the margin, with black glands more pronounced at the tip of the teeth, the lower leaves often petiolate; heads on longer peduncles; the rest u.s. (P) Distribution u.s.

Var. *hortensis* Fiori. Plant annual rarely biennial, smooth; flowers large, sulphur yellow or saffron yellow or orange. Outer achenes all broad, boat-shaped, tubercled or smooth, rarely beaked. Leaves large; the radical petiolate. January-June. Cultivated, and sometimes met with on heaps of rubbish or in odd corners near gardens.

Var. *sicula* Cyr. in Balb. Plant perennial, suffruticose at the base, erect or spreading, more or less pubescent and scabrous, with stiff stems. Leaves mostly oblong-lanceolate or acuminate. Ligulate florets 20 mm long or more, saffron yellow or orange yellow; disk florets of same colour. Outer achenes few, narrow, with a short beak, tubercled on the dorsal side, hardly longer than the involucre. January-June. *Malta* and *Gozo*, frequent along walls of fields and on rocky and stony ground, sides of valleys etc.-*Calendula stellata* Zeraph.-*C. fulgida* Ber. non Raf.

The form: *discolor* mihi, with whitish tomentose foliage, ray-florets golden-yellow or orange-yellow, and disk florets dark reddish-orange or purplish, is



frequent with the preceding in dry rocky localities, at Boschetto, Imtahleb, Bahria, Gneina, Melleha etc.

Var. *fulgida* Raf. Plant often annual, much branched from the base. Heads large. Ray florets and disk florets all of same colour, usually orange-yellow, sometimes sulphur-yellow in plant with very wavy foliage (form: *undulata* Raf.). Ray achenes narrow, subcylindrical, curved, with a very long beak; other achenes are boat-shaped, winged, tuberculose on the back; the inner achenes are almost ring-shaped, rugose on the back. With the preceding variety in *Malta* and *Gozo*, and often common. It is also found in *Comino*, at Kala Santa Maria and near the tower. The form: *undulata* Raf. is found at Boschetto, Ghain il Cbira, Wardia, Gheriexem and Bahria. February-May.

Var. *melitensia* Sommier et Caruana-Gatto. Plant perennial, woody at the base, with the ray achenes narrow, finishing in a long beak as in var. *fulgida* Raf.; without pronounced ridges on the back, but only tuberculose-scabrous, as in var. *sicula* Cyr. in Balb., and pubescent-scabrous as in var. *maritima* Guss. *Malta* and *Gozo*, with the preceding varieties; and also in the valley at Kala Santa Maria, *Comino*. February-May. Very variable: the ray ligulate florets may be yellow or orange-yellow, and the disk florets may be yellow, or rarely dark purplish, but the heads are always large. Possibly, instead of a distinct variety, it only represents a number of transitional forms between var. *fulgida* and var. *sicula*, the characters of the ray achenes, as above described, being by no means constant.

Var. *maritima* Guss. Plant scabrous, viscid, perennial, suffruticose. Flowers saffron-yellow or orange, all of same colour, but smaller than in the preceding variety. Outer beaked achenes, cylindrical, recurved, scabrous or pubescent; the median achenes boat-shaped, narrowly winged, rugose on the dorsal side; the inner ones narrow, very recurved or ring-shaped, rugose on the dorsal side. October-May. In sandy places not far from the sea; *Malta*, rare, St Julians, St. Paul's Bay, Bugibba, Marsascala, according to Delicata and Gulia.

#### TRIBE VII-HELIANTHEAE.

Ray-florets female or sterile; disk florets hermaphrodite; rarely all florets hermaphrodite. Anthers not prolonged in an appendix at the base. Style bifid, with stigmatic segments truncated, obtuse or compressed. Receptacle furnished with scales. Pappus wanting, or made of short bristles or scales or of a membranous ring. Leaves usually opposed or whorled, rarely alternate.

#### HELIANTHUS L.

Heads terminal, with ligulate ray-florets. Outer scales or bracts of involucre leaf-like, flaccid acute; inner scales shorter, membraneous. Receptacle flat or convex, with oblong acute scales, half surrounding the achenes. Segments of stigma long, semicylindrical, with papillose or fimbriated inner stigmatic surfaces. Achenes compressed or almost quadrangular, hairy or glabrous,

bearing as pappus two membranous mucronate scales. Includes about 55 species, natives of America, mostly of North America.

**HELIANTHUS TUBEROSUS L.** Plant perennial, or with thick perennial tuberous rhizomes. Stems and foliage scabrous and pubescent, 5-15 diameter high. Leaves alternate, opposed or whorled in 3, the lower somewhat cordate at the base, the upper ovate or lanceolate, with petioles ciliated at the base. Heads in a branched corymbose inflorescence, with peduncles not thickened at their insertion. Involucral bracts lanceolate, ciliated along the margin. Flowers (ray and disk) golden yellow. Achenes dark brown. (P) North America; cultivated and almost naturalised at Wied Gherzuma, Ghain Tuffieha etc. August-November. E. Jerusalem Artichoke, I. Topinambur, Patata del Canada. M. Articiok, Patata ta Gerusalem.

#### TRIBE VIII-AMBROSIEAE.

Heads monoecious: the male with many flowers furnished with corolla; the female with 1-2 flowers without corolla. Anthers free, furnished at the apex with an incurved process. Achenes without pappus, enclosed in a hardened involucre. Leaves alternate, the lower sometimes opposed.

#### AMBROSIA (Tourn.) L.

Heads in racemes; the male at the top of the raceme, hemispherical, many-flowered, with one series of involucral scales more or less connate; florets tubular 5-toothed, receptacle slightly convex, furnished with bristles; the female heads at the base of the raceme in the axil of the bracts, with only one floret, without corolla, enclosed in an oval involucre, prolonged in a tube with surrounds the style; stigmas filiform, two, exserted. Achene without pappus, enclosed in the hardened woody, tubercled, beaked involucre. Includes 15 species, all natives of America, except the following.

**AMBROSIA MARITIMA L.** Plant annual or biennial, softly villous and ashy green or whitish, with adpressed hairs, and with an agreeable odour. Stem erect, branched, 1-6 diameter high. Lower leaves opposed, upper leaves alternate, all petiolate, ovate, bipinnate, with oblong segments which are lobed or obtusely toothed. Racemes terminal, spike-like, male heads being numerous, yellow and pendulous. (A) or (B) Mediterranean region and Tropical Africa. June-November. In sandy places close to the sea-shore. *Malta*, frequent at Melleha, Saline, St Paul's Bay, Bugibba, Bahar ic-Ciaghak, Kalet Malku, Ghain Tuffieha, Gneina, Marsa, Marsascala; sometimes inland, as at Wied Kannotta and Ghain Rihana; Gozo, marsalforno, Kbaijar, Ramla; *Comino*, Kala Sta. Maria. E. Demigod's food. I. Amrbrosia. M. Mentna.

#### XANTHIUM (Tourn.) L.

Heads in axillary spikes; the male at the top of the spike, globose, many-flowered, with free involucral scales in one row; receptacle cylindrical, furnished with scales; the florets have a sterile ovary and a simple style, with a tubular corolla, 5-toothed: the female are below, each head bearing 2 florets

without corolla, enclosed in a bilocular, ovate, spinescent involucre, bifid at the top. Stigmas 2, u.s. Achene one in each involucre, naked, enclosed in the accrescent, woody, involucre, which is covered with hooked thorns, and terminates in 1-2 beaks. Leaves alternate. Includes 4 or 5 species, distributed all over the world.

XANTHIUM SPINOSUM L. Plant annual, erect or ascending with a cylindrical pubescent stem branched from the base, 2-5 diameter high. Leaves with a short petiole, cuneate, mostly trifid or entire, with lanceolate segments, the middle one being much longer, tomentose and white on the under surface and along the nerves on the upper surface, the rest of the upper surface being green and pubescent; with one or two very long yellow, very acute, trifid spines at the base of the leaf. Female heads almost solitary, in the axil of the leaf, becoming reflexed at maturity; with an elliptical involucre covered with slender yellow thorns. (A) Europe, Caucasus, Mediterranean region, South Africa, Australia, America. September-November. *Malta*, not common, at Marsa and near Addolorata Cemetery. *Gozo*, rare, Marsalforno and along via Migiarro. E. Cockle-bur, Spiny Clot-bur. I. Lappola.

#### TRIBE IX-CYNAREAE.

Heads without ligulate florets, that is with florets all similar, tubular and hermaphrodite; rarely with sterile ligulate or bilabiate ray-florets, or with female ray florets; very rarely with unisexual dioecious flowers. Base of anther prolonged on each side in a tail-like process. Style cleft into 2 short segments, thickened or hairy at or below the division into segments. Receptacle furnished with bristles, or paleae or scales. Pappus made of bristles, rarely of scales or wanting. Leaves alternate.

#### ECHINOPS L.

Inflorescence globose and ball-shaped, made of numerous one-flowered heads densely inserted on a naked globose receptacle. The involucre of each head is made of several series of scales, the outer bristle-like, the inner larger, acuminate, keeled, scarious, more or less ciliated. Florets hermaphrodite, with atubular 5-cleft corolla. Filaments of stamens connate. Stigma divergent, protruding, long. Achenes almost cylindrical, silky, with a short pappus made of fringed scales connate in a ring. Includes about 60 species, natives of the Mediterranean region, as far as Abyssinia, India and Siberia, 1 being native of eastern tropical Africa.

ECHINOPS RITRO L. Plant perennial, with an erect stem, simple or branched above. Leaves more or less deeply divided, with toothed spiny segments. Inflorescence about 3 to 4 cm in diameter. Outer involucral scales all free, triangular or spatulate, not prolonged in a spinescent process, bluish green. Flowers white, stigmas rather short. Achenes with reddish hairs. (P) South Europe, Western Asia, Central Russia as far as Siberia. E. Globe-thistle.

Var. *siculus* Strobl. Stem stout, hairy and cobweby, 5-20 diameter high. Leaves sinuate and lobate, tomentose and ashy white on the under surface, the lower petiolate, the upper amplexicaul, hairy and glandular on the upper surface. Bristles of the involucre of the heads 5-10 mm long. May-July. *Malta*, rare, at Corradino according to Delicata, and at Ghirghenti. *Gozo*, according to Gulia.-*Echinops ruthenicus* Guss., Delic.-*E. sphaerocephalus* Zeraph.-*E. Ritro* var. *polycephalus* Ten. The plants at Ghirghenti, seen in 1924, belong to this variety, and were over 2 m high.

#### ATRACTYLIS L.

Heads solitary, many-flowered. Involucre with 2 series of bracts; the outer leaf-like reticulate and spiny, the inner scaly, entire, scarious. Receptacle furnished with fringed scales. Flowers all similar and hermaphrodite. Anthers with a long process at the apex, and with the base prolonged on each side in a hairy appendix, Stigma with two connivent lobes. Achenes cylindrical, silky. Pappus made of one row of plumose bristles, connate at the base, forming a ring, surrounded by the upper long hairs of the achene. Species 15, natives mostly of the Mediterranean region, 2 being natives of China and Japan.

ATRACTYLIS CANCELLATA L. Plant tomentose and cobweby; stems simple or slightly branched above, 3-25 cm high. Lower leaves petiolate, lanceolate; the others linear, sessile: all ciliated and spinescent along the margin. Heads oval; if more than one is present the middle one is lower. Outer bracts of involucre arcuate and connivent, much longer than the head and often purplish at the apex. Inner scales or bracts, closely imbricate, lanceolate, prolonged into an awn, and often purplish at the tip. (A) Mediterranean region and the Canaries. April-May. *Malta*, not common, St Paul's Bay, Puales, Fort Manoel, St Julians, Wied il Cbir, Corradino, Imtahleb, Wied Encita, Gneina, Wied Znuber, Mghatab etc.-*Acarna cancellata* All.-*Carthamus cancellatus* Lam.-*Cirsellium cancellatum* Gaertn.

The form: *canescens* Rouy, with larger heads, and shorter outer bracts, yellowish spines and more tomentose plant, is met with at Puales and at Wied il Cbir, along road St Julians-Birchircara.

#### CARLINA (Tourn.) L.

Heads many-flowered, solitary or in corymbs. Outer involucral bracts leaf-like, pinnate, spiny; inner bracts in several series, scarious. Receptacle with fringed scales. Florets all similar and hermaphrodite, with 5-cleft corolla. Anthers u.s. Stigma bifid at the apex. Achenes obcuneate, silky and hairy, with pappus made of 1-2 series of plumoe bristles, in tufts of 3 or 4, and all connate at the base, forming a ring. Includes 17 species natives of Europe, the Mediterranean region as far as Siberia, and the Canaries.

CARLINA GUMMIFERA (L.) Less. Plant with a long and very tick root, containing a resinous milky juice, and almot stemless. Leaves radical and rosulate, large, more or less cobweby, lanceolate, pinnatifid, with divided toothed and spiny segments. Heads almost sessile, solitary or rarely 2-3

together, large, hemispherical. Involucre about as long as the florets; outer bracts coriaceous, lanceolate, reflexed above, whitish and tomentose, with strong branched spines at the apex and margin; the next small and short, lanceolate, spiny at the apex; the inner scarious, linear-acuminate, ciliated, purplish at the apex. Corolla purplish. Pappus four times as long as the achene. (P) Mediterranean region. September-October, rarely in November or later. *Malta*, *Gozo* and *Comino*, very common on rocky and uncultivated ground everywhere, sometimes close to the sea shore. The root is sweetish, but very poisonous; children eating of it have been repeatedly poisonous; with fatal results.-*Atractylis gummifera* L.-*Acarna gummifera* W.-*Carthamus gummiferus* Lam. E. White Chamaeleon. M. Xeuk il Miscta.

**CARLINA SICULA** Ten. Plant almost glabrous, with a strong stiff stem, simple or more commonly branched corymb-like above, 2-7 diameter high. Leaves coriaceous, with stiff spines. Heads large, 5-6 cm in diameter; outer bracts usually longer than the inner and finishing in a long stout spine; inner bracts spreading star-like; silvery white, purplish red at the base on the outer side; middle bracts green, entire, about as long as the star-like bracts. Central head larger and shorter. Scales of receptacle fringed. Corolla purplish. Pappus made of one series of bristles, about twice as long as the achene. (P) Italy, Sicily, Lampedusa, Candia. May-August. *Malta*, Wied hal-Lia, Sghaitar near Naxaro, but rare.-*Carlina bracteata* Presl. M. Sebket l'omma.

**CARLINA LANATA** L. Plant annual, rarely biennial, tomentose and cobweby, with an erect stem slightly branched, the central head being much larger and on a short-peduncle. Leaves coriaceous, lanceolate, conduplicate, sinuate-pinnatifid, spinous, the upper amplexicaul, the radical almost petiolate. Head hemispherical, 3-5 cm in diameter. Outer involucre bracts long and leaf-like; the median bracts linear-lanceolate, acuminate and spiny only at the tip; inner bracts glabrous, scarious and narrow. Scales of receptacle fringed, with long thick fringes. Corolla pink or purplish. Pappus twice or thrice as long as the achene. (A) or (B) Mediterranean region. June-July. *Malta* and *Gozo*, rather frequent, on uncultivated and arid ground, and along roads.-*Mitina lanata* Cass. The form: *Pola Hacq.-C. lanata* var. *monocephala* D.C., with a simple and rather short stem, terminating in only one head, is also frequent. M. Sebket l'omma.

**CARLINA CORYMBOSA** L. Plant perennial glabrous or slightly cobweby, with an erect striated leafy stem, 2-6 diameter high. Leaves coriaceous, conduplicate, lanceolate, lobate or pinnate, with yellow spines, the radical with a short petiole, the cauline amplexicaul. Stems branched above corymb-like, with hemispherical heads 3-5 cm in diameter, solitary, at the apex of the branches. Outer involucre bracts leaf-like, median bracts oblong, green, not more than half the length of the inner bracts and terminating in a short spine; inner bracts spreading star-like, scarious, linear, acute, yellow, or purplish on the outer side, usually glabrous, about 2 mm broad. Scales of receptacle fringed. (P) Mediterranean region.-*Mitina corymbosa* Cass. E. Carlina-thistle. I. *Carlina raggio d'oro*. M. Sajtun.

Var. *involucrata* Poir.- *C. corymbosa* var. *major* Lge. Stems purplish, glabrous, less densely clad with leaves, which are large, simply lobed and less spiny. Outer involucre bracts fewer, larger, with 1-2 spines on each side. Branches few, 1 or 2, each bearing a head. July-September. *Malta*, *Gozo* and *Comino*: very common on uncultivated ground, along roads, walls of fields and in rocky valleys.

Var. *globosa* Arc. Heads globose, rounded at the base, with the outer involucre bracts slightly shorter than the inner, and broadly lanceolate. *Malta*, *Gozo* and *Comino*, very common in the same localities as the preceding, and often entirely replacing it.

#### CRUPINA Cass.

Heads with a few flowers, in a corymbose inflorescence. Scales of involucre in few rows, scarious, acute. Receptacle furnished with bristles. Ray-florets neutral, disk-florets hermaphrodite and fertile; corolla 5-cleft. Anthers with 2 rounded processes at the base and with an acute process at the apex. Stigma bifid. Achenes ovoid or oblong, pubescent, with a crenate dome-shaped crest at the apex. Pappus formed of a few outer rows of imbricate paleae, a median ring of long rigid toothed bristles, and an inner ring of short truncated paleae. Includes 2 species, natives of the Mediterranean region and Central Europe as far as the Caucasus.

CRUPINA CRUPINASTRUM (Moris.) Vis. Plant annual, with an erect, slender but stiff stem, branched above, or often simple, 1-5 diameter high, with branches without foliage. Lowermost leaves obovate and toothed, the others pinnate, with very narrow segments which are toothed and spinescent along the margin, and with tufts of hooked hairs at the apex. All leaves mostly woolly on the upper surface. Heads solitary at the apex of the branches, the central one usually larger, cylindrical or oblong, large, with 9-15 florets which are about 1½ times the length of the involucre, and purple. Involucre scales scabrous, with a narrow white margin, the inner being narrower and more acuminate. Pappus becoming purplish black. Achenes compressed at the base, with linear lateral hilum. (A) Mediterranean region and South Russia. March-April. *Malta*, not common, in arid and dry localities, Boschetto, Ta Laurenti, Pualet, wied il Cbir, Corradino, Bahar ic-Ciaghak, Mghatab.-*Centaurea Crupina* S. et S.-C. *Crupinastrum* Moris.-*Crupina vulgaris* Delic. Non Cass. E. Starry Scabious.

#### CENTAUREA L.

Heads solitary or in corymbs. Scales of involucre in many series, imbricate, coriaceous or membranous, with or without a scarious or spiny appendix. Receptacle furnished with bristles. Outer florets neutral, or rarely male with free anthers; inner florets hermaphrodite; rarely all hermaphrodite. Corolla 5-cleft, funnel-shaped in the ray-florets. Anthers caudate, with papillose filaments. Achenes more or less cylindroid, with lateral hilum. Pappus rarely wanting, usually made of paleae and bristles, or only of bristles or of paleae.

Includes about 470 species, mostly natives of the Mediterranean region, and Central Europe and Asia.

**CENTAUREA ALBA L.** Plant biennial or perennial, with angular erect or ascending, stems, branched, 5-60 cm high. Leaves pinnate or bipinnate, with toothed or entire segments. Heads variable; involucral scales entirely scarious, concave and swollen, round, more or less toothed or fringed, white or with a brown sport in the middle, finishing in a long setaceous process. Flowers purplish or white. Achenes slightly pubescent, white or dark. Pappus wanting or made of paleae not more than half as long as the achene. (B) or (P) South Europe, North Africa and South Russia.

Var. *splendens* L. Plant hairy and scabrous, but green. Leaves mostly pinnate; with narrow or linear segments. Involucral scales not mucronate. Flowers white.-*Centaurea leucolepis* D.C. April-May. *Malta*, at Wied Ghomor according to Delicata and Gulia, but not found again. E. Centaury, Knapweed. I. *Centaurea cicalina*.

**CENTAUREA CRASSIFOLIA Bert.** Plant perennial, smooth and glabrous, suffruticose, of a bushy habit. Stem erect, branched from the base, 2-8 diameter high, densely covered with leaves. Leaves spathulate, fleshy, with a short petiole, deep green, persistent, entire. Floral stems sparsely furnished with linear spathulate small leaves, uppermost leaves like linear bracts. Heads large, 2-3 cm in diameter, ovate-conical, on long peduncles. Outer involucral scales oval-obtuse, the inner oblong, without a scarious margin. Flowers purplish blue. Achenes glabrous, striated, with a whitish pappus longer than the achene. (P) April-August. *Malta*, frequent on the rocky precipitous cliffs at Wied Babu, Wied iz-Zurriek, wied Mokbel, Fomm ir-Rieh, Ghar Lapsi, Gzira and Dingli, mostly on cliffs facing the sea. Gozo, in similar localities along the coast from Imgiar to Dueira.-*Centaurea spathulata* Zerafa non Ten. This plant, an obvious palaeogenetic type, is special to the Maltese Islands, and differs markedly from all other species of *Centaurea*. It was first described by Prof. Zerafa in 1827, under the name of *Centaurea spathulata*, which so well describes its characteristic foliage. It was described again by Bertoloni in 1829, under the name of *Centaurea crassifolia*, on the plea that the name of *spathulata* has been already given by Tenore to another *Centaurea*, and accordingly the name *Centaurea crassifolia* Bert. has become universally adopted by botanists. However, as Tenore gave the name *spathulata*, not to a species of *Centaurea*, not even to a variety, but only to an indistinct form of the variety; *transalpina* Schleich, of *Centaurea jacea*, according to the law of priority the name given by Zerafa should be preferred, and the species should be quoted as *Centaurea spathulata* Zerafa non Ten. this plant is now frequently seen cultivated in the public gardens of *Malta*, on account of its deep green foliage and its pretty purplish blue flowers. E. Maltese Centaury. M. Widnet il Bahar.

Var. *serratifolia* Fiori. Plant with upper leaves serrated. Collected by Duthie on the rocks of Ta Cenc in Gozo. It should be stated, however, that the plants cultivated in the public gardens, originally brought from Wied Babu, (*Malta*),

and invariably propagated by cuttings, often show the upper or floral leaves sparsely but deeply serrated or toothed.

**CENTAUREA MELITENSIS L.** Plant annual, with an erect, winged stem, branched at the base or above, with erect or spreading branches narrowly winged, 1-8 diameter high. Leaves densely papillose and scabrous, decurrent; the radical, and often also the lower cauline, lyrate or pinnatifid, with short obtuse segments, the others linear, entire or sparsely toothed. Heads small, ovate, often grouped in pairs of threes or more, usually with bracts. Involucre globose, glabrous or cobweby, yellowish green; with scales provided with a slender and fragile spine not more than 1 cm in length, the outer scales having 2 or 3 smaller spines on each side, the inner scales scarious and acuminate at the apex. Corolla yellowish white, very glandular. Achene hairy, with a broad hilum, and with a pappus as long as the achene. (A) South Europe, North Africa, Canaries, Madeira; naturalised in South Africa, Australia, India, Tasmania, North and South America. April-July. *Malta*, frequent in many places, Boschetto, Bugibba, Wied il ghasel, San Martin, Wied Encita, Marfa, ghain Tuffieha, Gneina, Zurriek etc. *Gozo*, also frequent in several places, but chiefly at Ta Cenc and Imgiar ix-Xini. *Comino*, frequent all over the Island.

**CENTAUREA SOLSTIZIALIS L.** Plant annual, more or less smooth, but tomentose and cobweby. Stem u.s. 1-5 diameter high, with decumbent or spreading branches. Radical leaves lyrate or runcinate. Cauline leaves u.s., decurrent. Heads always solitary; involucre tomentose or cobweby, yellowish; involucre scales with a spine u.s., but usually longer than 1 cm., outer scales with 1 or 2 rarely 3 smaller spines on each side; inner scales with a scarious roundish toothed appendix. Corolla yellow, not glandular. Achenes with small roundish hilum. (A) Mediterranean region, Central Europe and South Russia; naturalised in North America. June-October. *Malta*, very rare, at Corradino, Wied Znuber and Imtahleb, in arid and stony localities.-*Calcitrapa solstitialis* Lam. e. Barnabas. I. Spino giallo, Calcatreppola.

**CENTAUREA NICAENSIS All.** Plant biennial or perennial, scabrous and papillose. Stems erect or spreading, angular, branched, 1-5 diameter high. Radical and lower leaves lyrate-pinnatifid, with toothed segments: cauline leaves oblong or lanceolate, toothed, winged at the base and amplexicaul, but not decurrent. Heads solitary, surrounded by floral leaves, on a peduncle thickened at its insertion. Flowers yellow. Involucre globose, glabrous or cobwebby, with the median scales finished in a strong yellow recurved spine 5-20 mm long, with 1-2 small spines on each side and a small ciliated membrane. Inner scales with a scarious roundish toothed appendix. Corolla glandular. Achenes hairy, with a transversely broad hilum, and a pappus about one-third the length of the achene. (B) or (P) Italy, Sardinia, Sicily, Spain, North Africa. April-June. *Malta*, *Gozo* *Comino*; rather common on uncultivated ground, rocky places, along roads, and along walls of fields. Most plants belong to the form: *fuscata* Desf., having the median and often also the other scales brown at the base of the spines.-*Centaurea marginata* Ten.-*C. sicula* Lam.



**CENTAUREA CALCITRAPA L.** Plant annual or biennial, pubescent and cobwebby, but greenish. Stem erect, much branched from the base, 1-6 diameter high, with spreading branches. Leaves soft, pinnatifid, with teeth and segments mucronate and often spinescent; the radical petiolate, the cauline sessile but not decurrent. Heads small, sessile or on short peduncles, lateral or terminal, furnished with linear floral leaves. Involucre ovoid, usually glabrous, pale green or whitish: outer scales with narrow scarious margins finishing in a long yellowish or whitish spine with 2-3 short spines on each side: inner scales with a scarious spineless appendix. Flowers pink, very rarely white. Achenes glabrous; pappus almost wanting. (A) or (B) Central and South Europe, North and Tropical Africa, Asia Minor and India. May-July. *Malta*, rare, usually met with in single specimens, at St Paul's Bay, Musta near ta Mlit, Ta Vnezia. Gozo, also rare, Ta Cenc-*Calcitrapa stellata* Lam.-C. *Hypophaestum* Gaertn.-*Rhaponticum Calcitrapa* Scop. E. Caltrops, Star-thistle. I. Calcatreppola, Ippofesto.

The plant found at Musta belongs to the form: *horrida* Ten., with tufts of long, straight whitish spines at the apex of the main stem and branches.

#### **CARTHAMUS (Tourn.) L.**

Heads large, solitary, furnished with leaf-like bracts. Outer bracts of involucre leaf-like, coriaceous, spiny; the inner scarious at the apex. Receptacle furnished with long bristles. Florets all hermaphrodite, or sometimes with a few sterile ray-florets. Corolla 5-cleft. Anthers not caudate. Achenes more or less tetragonous, with lateral hilum. Pappus wanting, or reduced to a few paleae. Includes about 20 species, natives of the Mediterranean region, Central Europe, India, Abyssinia and the Canaries.

**CARTHAMUS LANATUS L.** Plant annual or biennial, glandular and viscid, hairy and cobwebby, with a reddish juice. Stem erect, branched above corymb-like, or simple, 1-9 diameter high. Leaves tough, the lower or radical petiolate, pinnate or lyrate, the cauline amplexicaul, oblong, pinnate, with spiny segments and teeth. Heads large terminal, the laterals higher. Flowers yellow. Involucre ovoid; outer bracts foliaceous, lanceolate, spinous, as long as the florets; the inner scarious linear-lanceolate, entire. Achenes pyramid-shaped, rugose above; pappus made of scabrous toothed scales, the inner ones being thrice as long as the acheme. (A) or (B) Mediterranean region, Central Europe as far as India, Abyssinia, Madeira, the Canaries. May-July. *Malta* and *Gozo*, very common along roads, and on uncultivated and waste ground-*Kentrophyllum lanatum* D.C.-*Atractylis lanata* Scop-*Carduncellus lanatus* Moris. M. Xeuk il far, Xeuk ta Cristu.

**CARTHAMUS TINCTORIUS L.** Plant annual, glabrous. Stem erect, branched above corymb-like, 3-10 diameter high. Leaves oblong, toothed and spinous, sometimes entire, rarely spineless; the radical petiolate, spathulate, acute, pinescent. Flowers yellowish-red or saffron. Heads large u.s.; outer bracts ovate, more or less spinescent: inner bracts oblong, acute. Achenes white, tetragonous, truncated and with 4 gibbosities at the apex. Pappus wanting. (A) Native of Tropical Africa. June-August. Cultivated in

*Malta*, *Gozo* and *Comino*, for the sake of its seeds which are the preferred food for parrots. The flowers are used to adulterate or substitute saffron. Sometimes met with self-sown. E. Bastard Saffron I. Zafferanone. M. Ghosfor.

**CARTHAMUS CAERULEUS L.** Plant rhizomatose and perennial, more or less hairy, cobwebby and papillose. Stem stiff, erect, usually simple and bearing only one head, 2-4 diameter high. Radical leaves oblong-lanceolate, green, toothed and slightly spinescent, or more or less segmented almost pinnate. Flowers blue. Heads ovoid, large, terminal. Outer bracts of involucre leaf-like, ovate or lanceolate, toothed and spiny; the others yellowish finishing in a scarious brown appendix fringed or toothed. Achenes almost oval, scabrous and tubercled near the apex. Pappus made of yellowish bristle-like toothed scales, the central ones being longer than the achene. (P) Mediterranean region and the Canaries. May-June. *Malta*, rather rare; chiefly on clayey soils, at Boschetto, Ghirghenti, St. Paul's Bay, Notabile, Imtahleb, ta l'Ischirvit near Gneina.-*Carduncellus caeruleus* D.C.-*Kentrophyllum caeruleum* Gr. et Godr.-*Onobroma caeruleum* Spr.

Var. *tingitanus* L. Lower leaves pinnatifid or pinnate, with toothed lanceolate or oval segments. Plant more developed than the species, higher, and often with 2 or more heads. The form: *pinnatifidus* Sang. has leaves with very narrow lanceolate or linear segments. *Malta*, with the species, especially at Ghirghenti.-*Carduncellus tingitanus* D.C.

#### CARDUNCELLUS Adans.

Differs from *Carthamus* by the achenes being acutely tetragonous; pappus made of plumose bristles, connate at the base, forming a ring which may be detached off entire. Corolla blue. Includes about 16 species, natives of the Mediterranean region, mostly of North Africa.

**CARDUNCELLUS PINNATUS (Desf.) D.C.** Plant glabrous, or slightly cobwebby along the median nerve of the leaf, perennial and rhizomatose. Stems bearing only one head, 5-20 cm high, sometimes very dwarf or stemless (form: *acaulis* Presl.) Segments of leaves oval or lanceolate, small, toothed and spinescent, often winged at their base by the presence of an ear-like lobe. Head 3-4 cm in diameter, ovoid glabrous. Outer bracts very broad and fleshy at the base, with a ciliated or spinescent leafy process. Achenes rugose, 7 mm long. Pappus brown red. (P) North Africa and Sicily. May-June. Mentioned by Gulia as existing in *Malta*, but not found by others.-*Carthamus pinnatus* Desf.-*Onobroma pinnatum* Spr.

#### CARDUUS (Tourn.) L.

Heads solitary or in corymbose inflorescence. Scales of involucre in several series, imbricate, the outer spinous at the apex. Receptacle with fibrils. Florets all similar and hermaphrodite, rarely the outer ones sterile. Corolla 5-cleft. Anthers caudate at the base; filaments hairy. Achenes obovate-compressed, glabrous, streaked longitudinally. Pappus made of many rows

of scabrous bristles, connate at the base, forming a ring, and easily deciduous. Includes about 80 species, natives mostly of the Mediterranean region, but extending from Europe to Japan.

**CARDUUS PYCNOCEPHALUS L.** Plant usually annual; stem erect, more or less cobwebby, 1-10 diameter high. Leaves ashy green or tomentose on the under surface, cobwebby on the upper surface, the radical and lower cauline oblong-obovate, sinuate-pinnate, with angular toothed spinous segments. Floral leaves not higher than the heads, and furnished with spines like the other leaves. Heads in clusters of 2-3, sometimes solitary, deciduous, with 12-25 florets. Involucre cobwebby and tomentose, with the inner scales shorter than the florets, scarious at the tip and acuminate, and the outer scales scarious along the margin, terminating in a spinescent keeled process, usually recurved. Flowers pink, or purple, or white. (A) or (B) Mediterranean region, Central Europe and the Canaries.

Var. *brevisquamus* Fiori. Stems broadly winged. Flowers often white. Outer involucre scales short, ovate-lanceolate, abruptly acuminate.-*Carduus arabicus* Guss. non Jacq.-*C. panormitanus* Tod. ex Nym.-*C. peregrinus* Ten. March-June. *Malta*, *Gozo* and *Comino*, frequent along roads, on heaps of rubbish, in valleys etc.

Var. *tenuiflorus* Curt. Stems broadly winged up to the insertion of the heads. Heads in clusters of 3-20; outer scales broadly scarious along the margin, and abruptly acuminate. Wings of stems not densely fringed and spinous.-*Carduus tenuiflorus* var. *acanthifolius* D.C. March-June. *Malta*, *Gozo* and *Comino*; very common along roads, in valleys and also on uncultivated ground and in fields. E. Slender thistle. I. Cardo. I. Xeuk, Horfox.

**CARDUUS MARMORATUS Boiss. et Heldr.** Plant annual, with strong spines. Stems u.s. Leaves more or less glabrous on the upper surface, and marbled with white. Floral leaves higher than the heads, and furnished with stronger spines than the other leaves. Heads small, sessile, in clusters of 3-6. Outer scales cobwebby, short, lanceolate, abruptly mucronate-spinescent. Flowers purple. (A) *Malta* and *Lampedusa*. March-June. *Malta*, *Gozo* and *Comino*; very common along roads, lanes, on uncultivated ground, in valleys, fields etc.-*Carduus arabicus* D'Urv.-*C. pseudo-syriacus* Lojac.-*C. pycnocephalus* var. *lopadosanus* Arc. M. Xeuk. Horfox.

### CIRSIUM (Tourn.) Adans.

Florets all hermaphrodite, rarely dioecious, or rarely the ray-florets sterile. Filaments free. Achenes compressed or pyriform. Pappus made of plumose bristles, the outer row often club-shaped at the end. The rest as in *Carduus*. Includes about 120 species, distributed in both hemispheres north of the equator.

**CIRSIUM SYRIACUM (L.) Gaertn.** Plant annual, with an erect, rigid stem, simple or branched above, pubescent below, 2-25 diameter high. Leaves

oblong, glabrous, veined white, pubescent on the lower surface: the lower petiolate, sinuate-lobed, toothed and spinescent: the upper amplexicaul, more deeply divided, with stouter spines. Heads  $1\frac{1}{2}$ – $1\frac{1}{2}$  cm in diameter, sessile or shortly peduncled, more or less racemose. Floral leaves longer than the heads, and reduced to stout pinnate spines. Involucre globose-campanulate, with lanceolate, acuminate, spinescent scales, partly recurved. Receptacle with flat bristles. Flowers purplish red, very rarely white (form: *albiflorus* Maur.); outer florets sterile. Achenes obliquely obovate, compressed. (A) Mediterranean region as far as the Caucasus, Madeira, Canaries. April-May. *Malta*, very common on waste ground, in valleys and also in fields, especially in the western part of the Island; *Gozo*, also common at Sannat, Xlendi, Wied il Lunziata, Kbaijar.-*Carduus syriacus* L.-*Cnicus syriacus* Willd.-*Notobasis syriaca* Cass.-*Cirsium maculatum* Moench. E. Horse Thistle. M. Xeu tax-Xitan, Ghallis.

**CIRSIUM ARVENSE (L.) Scop.** Plant perennial and rhizomatose, sending up suckers at distance. Stem erect, angular, grooved, pubescent, more or less reddish, branched, 3-15 diameter high. Leaves glaucous green, the lower petiolate, the others sessile, sinuate-lobate, toothed and spinous, more or less decurrent. Heads in corymbs, small, numerous. Flowers dioecious, pale purple, sometimes white. Involucre globose-campanulate, cobwebby or glabrous, with small imbricate scales, the outer being ovate-lanceolate and spinescent. Pappus longer than the corolla, when in fruit. (P) Europe, as far as Japan and India; naturalised elsewhere. May-August. *Malta*, mentioned by Gulia as common, but not found by others.-*Serratula arvensis* L.-*Cnicus arvensis* Hoffm.-*Carduus arvensis* Sm.-*Breia arvensis* Less. E. Creeping Thistle.

#### LUPSIA Neck.

Heads in corymbs. Outer or marginal florets neutral, larger, and usually rose-coloured; central florets hermaphrodite. Filaments connate and papillose. Anthers not caudate, but with a long apical process. Achenes cylindroid, compressed, striated. Pappus made of plumose bristles. The rest as in *Carduus*. Includes 3 species, natives of the Mediterranean region, 2 being limited to Algeria.

**LUPSIA GALACTITES (L.) O. Kuntze.** Stem erect, slender, tomentose-white, winged and spinescent. Leaves usually spotted with white, cobwebby or glabrous on the upper surface, deeply pinnatifid and more or less decurrent, tomentose white on the lower surface, with triangular or lanceolate segments furnished with a very acute yellow spine. Heads rather small, on long or on short peduncles, and then clustered. Involucre campanulate, cobwebby; scales yellowish green furnished with a long apical trigonous process, more or less recurved. Corolla of marginal florets with very long segments. (A) Mediterranean region, Madeira, Canaries. March-June. *Malta*, *Gozo* and *Comino*, very common everywhere.-*Galactites tomentosa* Moench.-*Centaurea Galactites* L.-*Calcitrapa Galactites* Lam.-*Cnicus Galactites* Lois. The form: *albiflora* (N.Terr.) Fiori, with all florets white, is fairly common. The form: *caerulea* (Nicotra) Fiori, is rare, and has bluish flowers. The typical form

has rosy marginal florets, and white or very pale pink inner florets. E. Boar thistle, Creeping Thistle. M. Xeuk abjad.

#### SILYBUM (Vaill.) Gaertn.

Heads solitary, large. Involucral scales foliaceous, except the innermost, toothed and spinescent along the margin. Florets all similar and hermaphrodite. Filaments of stamens connate and papillose. Anthers with short apical process. Achenes obovate, compressed, smooth. Bristles of pappus toothed. The rest as in *Carduus*. Includes 2 species, one of which is limited to Spain and Algeria.

SILYBUM MARIANUM (L) Gaertn. Plant annual or biennial, glabrous. Stem occasionally cobwebby, simple or slightly branched, stout, 2-15 diameter high. Leaves large, spotted with white, sinuate, toothed, spinous, with more or less triangular lobes; the lower almost petiolate, the upper amplexicaul. Heads large, terminal, globose, concave at the base: outer scales oval, prolonged in a lanceolate, coriaceous, acuminate spinous process, spinescent at the base, spreading or recurved, slightly longer than the flowers; innermost scales lanceolate, entire. Flowers lively purple, very rarely white. (A) or (B) Mediterranean region as far as North India, Central Europe, Madeira, Canaries; naturalised in North America. April-May. *Malta* and *Gozo*, common along country roads, on dumping heaps of rubbish, in country lanes, sometimes in fields.-*Carduus Marianus* L.-*Cirsium maculatum* Scop.-*Silybum maculatum* Moench. The form: *pygmaeum* Cass. Bearing only one head, on stems non exceeding 15 cm in height, is met with in arid localities. E. Blessed Thistle, Milk Thistle. I. Cardo Mariano. M. Xeuk baghli.

#### CYNARA (Vaill.) L.

Heads solitary. Scales of involucre coriaceous and spinous. Florets blue, all similar and hermaphrodite. Filaments free, papillose and hairy. Anthers with an obtuse apical process. Stigmas very long, protruding. Achenes obovate, almost tetragonous. Bristles of pappus plumose. The rest as in *Carduus*. Includes 6 to 10 species, natives of the Mediterranean region and the Canaries.

CYNARA CARDUNCULUS L. Stem thick, erect, grooved and striated, tomentose and cobwebby, simple or more frequently branched above, corymb-like, 15-60 cm. high. Leaves large, green, slightly tomentose on the upper surface, tomentose and whitish on the under surface, all pinnatifid or bipinnatifid, with lanceolate or linear segments, all lobed and toothed, each lobe or tooth terminating in a strong yellow spine, very acute, the spines at the base of the segments being often palmate. Heads solitary, large, oval-globose, 4-5 cm in diameter, with the outer scales coriaceous, broad and oblong; the intermediate scales finishing in a strong spreading spine, and the inner finishing in a scarious appendix, spinous at the tip. (P) South Europe, North Africa, Madeira and the Canaries. May-June. *Malta*, *Gozo* and *Comino*, common on rocky and uncultivated ground, especially in *Comino*.-

*Cynara horrida* Ait.-*C. silvestris* Lam.-*C. spinosissima* J. et C. Presl. E. Wild or Prickly Artichoke. I. Carduccio, Caglio. E. Kakocc tax-Xeuk.

Var. *Scolymus* L. Plant up to 150 cm high, with larger leaves ashy green and cobwebby on the upper surface, thickly tomentose and white on the lower surface, pinnatifid or bipinnatifid, spineless or slightly spinous. Heads up to 12 cm in diameter, with broader outer bracts, fleshy at the base.-*Cynara Cardunculus* var. *sativa* Moris.

The form: *sativa mihi*, has a dwarfier plant not more than 120 cm high, entirely spineless; head larger, with more numerous bracts and more fleshy at the base. Leaves with shorter petioles. Cultivated for the sake of its heads, and sometimes also of its shoots. E. globe Artichoke. I. Carciofo. M. Kakocc.

The form: *costrata mihi*, has a taller plant, spineless or slightly spinescent. Heads smaller, with fewer bracts, less fleshy at the base, often spiny or spinescent at the apex. Petioles longer and thicker. Cultivated for the sake of the petioles. E. Cardoon. I. Cardo. M. Carduni, Zannur.

#### ONOPORDON (Vaill.) L.

Heads solitary or clustered. Involucral scales coriaceous and spinous. Receptacle without scales. Florets all equal and hermaphrodite. Filaments of anthers free and glabrous: anthers bilobed at the base, with an awn-like apical process. Stigmas long and exserted. Achenes obovate-compressed, slightly tetragonous, transversely rugose. Bristles of pappus usually scabrous or serrated. Includes about 20 species, natives of Europe and the Mediterranean region.

ONOPORDON SIBTHORPIANUM Boiss. et Heldr. Plant biennial or perennial, not glandular or viscid, but tomentose and cobwebby. Stem usually branched, 3-6 diameter high, with narrow wings, toothed and very spinous. Radical leaves oblong, the cauline lanceolate, all pinnatifid, with toothed spinous lobes. Heads solitary, sometimes on short branches and almost clustered, rather large, with a globose or ovoid involucre, pale green and cobwebby. Involucral scales ovate, with a long process arising from the base, semicylindrical, slightly recurved and finishing in a very acute spine. Corolla glandular, purplish-red. (B) or (P) *Linosa* and the Eastern Mediterranean region. May-June. *Malta*, not very common; along roads, on heaps of rubbish and on uncultivated ground, at Notabile, Musta, St. Paul's Bay, Ghain Tuffieha, Ghain Zhuber, Imtahleb, Melleha, Misida etc. *Gozo*, also not common, in similar localities at Sannat, Ta Cenc, Imgiar ix-Xini, Ramla. *Comino*, near the Hospital, Wied Ernu, and near Bejn-il-Cmiemen.-*Onopordon tauricum* Delicata non Willd.-*O. arenarium* Pomel.-*O. macracanthum* S. et S. non Schousb.-*O. tauricum* var. *horridum* Fiori.

#### SUB-FAMILY LIGULIFLOREAE.

Florets all ligulate. Plants furnished with laticiferous vessels.

## TRIBE X-CICHOREAE.

Florets all similar and hermaphrodite. Anthers caudate at the base. Receptacle naked or furnished with hairs or small scales. Pappus usually hairy, rarely wanting or membranous or scaly or furnished with bristles.

### SCOLYMUS (Tourn.) L.

Heads sessile, solitary or clustered, surrounded by floral leaves. Scales of involucre imbricate, acuminate, scarious along the margin: receptacle with membranous scales, winged, enveloping the achenes. Corolla yellow, slightly hairy on the outside. Pappus made of a crenate ring, or of 2-4 scabrous bristles. Includes 3 species, natives of the Mediterranean region as far as Nubia and the Caucasus.

**SCOLYMUS HISPANICUS L.** Plant annual or biennial, villous or glabrous, with an erect branched stem, incompletely winged. Radical leaves pinnatifid, with toothed spinous lobes; cauline leaves coriaceous, amplexicaul. Heads axillary or terminal, more or less racemose, about 3 cm long including the ligules, surrounded by 3-4 toothed and spinous floral leaves. Involucral scales glabrous, narrowly scarious along the margin. Scales of receptacle ovate-obtuse, toothed along the apex. Anthers golden yellow. (A) or (B) Mediterranean region, Asia Minor, Canaries, Madeira. May-July. *Malta*, *Gozo* and *Comino*, frequent in places not far from the sea.-*Scolymus maculatus* All. Non L.-*Myscolus microcephalus* Cass. E. Golden Thistle. I. Cardo scolino. M. Xeuk isfar.

**SCOLYMUS GRANDIFLORUS Desf.** Plant perennial, villous and hirsute, with an erect stem, simple or slightly branched, completely winged. Leaves deeply segmented, the cauline less broadly amplexicaul. Heads large, 4 cm long; involucral scales broadly lanceolate, abruptly mucronate, villous externally, broadly scarious along the margin. The rest u.s. (P) Oriental Pyrenees, Italy, Sicily, Sardinia, Pantelleria, Algeria. May-October. *Malta*, *Gozo* and *Comino*, in sea-side sandy places, sometimes inland as at Li Clin near Casal Lia, Notabile etc.-*Myscolus megacephalus* Cass. M. Xeuk isfar.

**SCOLYMUS MACULATUS L.** Plant annual, usually glabrous, glaucous green. Stem whitish, erect, dichotomously branched, completely and broadly winged, toothed and spinous. Leaves, bracts and wings of stem with a thick cartilaginous white margin. Cauline leaves with white nerves, sinuate and toothed, furnished with strong white spines. Heads terminal, solitary or in clusters of 3-4, furnished with comb-like and spinous floral leaves longer than the heads. Involucral scales lanceolate-acuminate, scarious-white along the margin; scales of receptacle obovate entire. Anthers bluish black. (A) Mediterranean region, Nubia, Canaries. June-August. *Malta*, St Paul's Bay, road Notabile-Siggieui, Ahrax, Melleha, road to Wied Gherzuma and Bahria, road to Saline etc. *Gozo*, Xaghra, Ggantia, Gnien xibla, Ramla, Nadur, Sannat etc. *Comino*, Kala Sta. Maria.-*Scolymus paniculatus* Ucria.-*Sc. pectinatus* Gus. E. Spotted Golden Thistle. M. Xeuk isfar.

### CATANANCHE (Vail.) L.

Heads solitary, borne on long peduncles. Involucral scales scarious, silvery white, imbricate in several rows. Receptacle flat, furnished with bristles. Achenes almost pentagonal, tomentose with applied hairs, grooved, conical, not beaked. Pappus made of 5-7 long setaceous toothed scales. Includes 5 species, natives of the Mediterranean region, 3 being limited to Algeria.

**CATANANCHE LUTEA L.** Plant annual, villous; stem simple or slightly branched. Leaves 3-nerved, lanceolate, entire or slightly toothed. Peduncles long, naked, or with 1-2 scarious bracteoles. Involucre campanulate: outer involucral scales ovate-obtuse, short, white, rusty in their middle; the inner longer lanceolate-acuminate. Flowers yellow, ligule not longer than the involucre. (A) Mediterranean region. March-May. *Malta*, rather rare, at St. Paul's bay, Puales, Bugibba, Pembroke Camp, St Andrew's Melleha, Wied Ghomor, Wied il Cbir.-*Piptocephalum luteum* Sch. Bip.

### CICHORIUM (Tourn.) L.

Heads axillary or terminal, with a double involucre; the outer consisting of 5 short scales, the inner of 8-10 longer ones. Receptacle flat and hairy. Corolla blue or light pink, rarely white. Achenes glabrous, pyramidal, striated; pappus made of 2-3 rows of bristles or scales, or of a fringed ring. Species about 4, natives of the Mediterranean region, one being native of Abyssinia.

**CICHORIUM SPINOSUM L.** Plant perennial, dwarf, woody at the base, much branched from the base, with spreading entangled branches, the upper being sterile and terminating in a spinous process. Leaves rosulate, somewhat fleshy, runcinate or toothed, glabrous. Heads of 5-6 florets, arising mostly in the fork of the branches, subsessile, usually solitary. Outer involucral scales oval or roundish, the inner lanceolate and 3 times as long. Florets twice as long as the involucre; pappus very short. (P) Spain, Balearic Islands, Greece, Candia, Cyprus, Cyrenaica, Sicily. May-July. *Malta*, *Gozo*, *Comino* and *Cominotto*, very common in arid and stony places, valleys, glacis around fortifications etc. M. Kanfuda.

**CICHORIUM INTYBUS L.** Plant annual or perennial, 2-15 diameter high, with spineless branches. Stem erect, grooved, flexuous, dichotomously branched, with rigid branches, smooth or somewhat hairy. Leaves more or less hairy and scabrous; the radical rosulate, runcinate, with toothed or entire segments; the cauline much smaller, lanceolate, or almost cordiform. Heads sessile, in axillary clusters of 1-5 often with a peduncled head on one side. Involucral scales glandular and slightly hairy, the inner not more than twice the length of the outer. Florets thrice as long as the involucre. (A), (B) or (P) Europe, Mediterranean region as far as China, naturalised elsewhere. May-October. *Malta*, rare, along Imriehel Road, Boschetto, Imtahleb, Ghain Rihana etc. *Gozo*, also rare, Xaghra, Nadur, Xlendi, E. Chicory. I. Cicoria, Radicchio. M. Cicueira. Frequently cultivated in several varieties.



Var. *pumilum* Jacq. Plant annual, rarely perennial; peduncles markedly thickened. Radical leaves usually undivided, floral leaves cordate and almost amplexicaul. Plant glaucous-green, almost glabrous, with heads often fascicled. May-August. *Malta*, rare, Boschetto, Hagiar Kim, Imriehel, Ghirghenti. *Gozo*, rare, at Cala Dueira and Wied il Lunziata. Usually represented by the form: *divaricatum* Schousb., with radical leaves runcinate, and plant taller and more branched.

CICHORIUM ENDIVIA L. is commonly cultivated in many varieties, and is occasionally met with in fields self-sown.

#### RHAGADIOLUS (Tourn.) Scop.

Heads lateral and terminal, with 8-12 florets. Involucre with 5 very small outer scales, and 5-8 inner long, keeled scales which become accrescent and hard, enveloping the marginal achenes. Receptacle flat, naked. Corolla yellow. Achenes cylindrical, beaked, glabrous, obliquely dilated at the base, and persistent. Pappus wanting. Includes only one species.

RHAGADIOLUS STELLATUS (L) Gaertn. Plant annual, glabrous or pubescent, 1-4 dm high, with spreading stems. Lower leaves petiolate, obovate or oblong, lyrate or toothed, with acute teeth or segments; upper leaves narrowly lanceolate, sessile, entire or toothed. Terminal heads on long peduncles. Marginal achenes 5-8, stellate, straight or slightly incurved, glabrous or slightly hairy, scabrous on the dorsal side; inner achenes 1-3, much shorter and incurved, glabrous or slightly hairy. (A) Mediterranean region, Persia, Canaries, Madeira. March-April. *Malta*, not frequent; at San Martin, Gneina, Imtahleb, Wied Gherzuma, Wardia, Ghain Mula. *Gozo*, rare; Nadur, from Wied Bingemma to Wied ir-Rihan.-*Lapsana stellata* L.

#### HYOSERIS L.

Heads many-flowered, terminal on radical peduncles. Flowers yellow. Inner involucre scales enveloping the achenes. Marginal achenes cylindroid, compressed, with a pappus of small scales: the intermediate achenes furnished with 2 wings, with a pappus of two series of bristle-like scales, the outer of which are shorter: inner achenes angular and cylindroid, often sterile. Includes 3 species, natives of the Mediterranean region.

HYOSERIS RADIATA L. Plant perennial, with a straight fleshy root. Leaves radical, rosulate, runcinate-pinnatifid, with triangular or rhomboid segments, angular and toothed, glabrous or powdery, or furnished with long hairs along the peduncles, midrib and petiole. Peduncles not thickened, erect, longer than the leaves. Marginal corollas often purplish-red on the outside. Involucre scales becoming stellate at maturity. (P) Mediterranean region. February-May. *Malta*, *Gozo* and *Comino*. Common along roads, in valleys, in weedy localities etc.-*Leontodon radiatum* Lam.-*Rhagadiolus radiatus* All.-*Hedypnois radiata* Gaertn.-*Taraxacum saxatile* Boccone. M. *Cicueira salvagga* or *Zigland*.

HYOSERIS LUCIDA L. Plant u.s. with fleshy, glabrous, shining leaves, with rounded triangular segments, entire or slightly toothed. Peduncles thickened at their insertion. With the preceding species, in *Malta*, *Gozo* and *Comino*, often considered as a mere variety, though always well marked. (P) The form: *grandiflora* Guss., a taller plant, with less fleshy and larger leaves, and longer flowers, as well as the form: *calyculata* Jan.-*imbricata* D.C., a smaller plant with more fleshy leaves, with segments partly covering each other; are also frequent.-*Hyoseris radiata* var. *baetica* Fiori.-*Thlipsocarpus baeticus* Kuntze.

HYOSERIS SCABRA L. Plant annual, with a slender root. Leaves u.s. scabrous and powdery, with oval-triangular segments, angular and toothed. Peduncles prostrate or erect, slightly longer than the leaves or equal to them, much thickened and clavate at their insertion. Heads smaller, cylindroid, with erect connivent scales. (A) Mediterranean region. March-May. *Malta*, *Gozo*, *Comino*, and *Cominotto*, very common in fields, on uncultivated ground, along roads, in valleys etc.-*Rhagadiolus scabrus* All.-*Hedypnois scabra* Less.-*H. microcephala* Cass.

#### HEDYPNOIS (Tourn.) W.

Heads and involucre scales u.s. Achenes cylindroid, incurved, grooved and ridged, scabrous: marginal achenes with a toothed squamous ring: inner achenes with 5-6 awn-like scales surrounded by a few short bristles. Includes only one species.

HEDYPNOIS POLYMORPHA D.C. Plant annual, scabrous, with long bristles, with simple or branched hairs. Leaves radical, obovate-oblong, entire or toothed, sometimes sinuate-toothed or even pinnatifid. Stems slightly branched, sometimes simple and monocephalous. Involucre globose when in fruit, usually hispid and bristly, sometimes almost glabrous. (A) Mediterranean region as far as Persia, Canaries, Madeira; naturalised in South America. March-May.-*Hyoseris Hedypnois* L.-*Rhagadiolus Hedypnois* All.

Var. *monspeliensis* W. Plant almost glabrous, with long slender peduncles. Heads pendulous when in flower. Involucre usually glabrous, sometimes densely covered with bristles.-*Hyoseris cretica* Cav. non L.-*H. monspeliensis* Pers.-*Hedypnois mauritanica* W.-*H. cretica* var. *gracilior* Boiss. Common in *Malta*, *Gozo*, *Comino* and *Cominotto*, on cultivated and uncultivated ground. The form: *pinnatifida* Wk. et Lge.-*Hedypnois pendula* var. *pinnatifida* D.C., with pinnatifid radical leaves, is frequent in gardens and valleys, especially in shaded localities.

Var. *rhagadioloides* W. Plant stronger, entirely scabrous and hairy, with leafy stems and shorter peduncles. Lower leaves sinuate or pinnatifid, head erect when in flower. Frequent in fields and gardens and along roads.-*Hyoseris rhagadioloides* L.-*Hedypnois furfuracea* Rehb.

Var. *cretica* W. Leaves scabrous and pubescent, sinuate or toothed. Stems glabrous, spreading or erect; peduncles in fruit slightly thickened, restricted below the involucre. Heads pendulous when in flower. Common, chiefly along walls of fields, in gardens and in valleys.-*Hyoseris cretica* L.-*Rhagadiolus creticus* All. The form: *coronopifolia* Ten. is met with on good soils or in moist situations.

Var. *tubaeformis* Ten. Plant strong, but dwarf, with leaves somewhat fleshy. Stems very short, peduncles long, much thickened and trumpet-shaped when in fruit, more or less prostrate, hardly restricted below the involucre. Heads erect when in flower. Plant scabrous and hairy. Frequent in *Malta*, *Gozo* and *Comino*, in more exposed situations. The form: *Gussonei* Fiori, with glabrous heads, and the form: *subacaulis* Fiori, with very short stems, and pinnatifid or lyrate lower leaves, are also met with.

### HYPOCHAERIS L.

Heads terminal, many-flowered. Receptacle furnished with membranous deciduous scales, one for each floret. Florets yellow. Achenes rugose, all similar and beaked, or the outer abrupt and briefly beaked and the inner with long beaks. Pappus made of one row of plumose bristles, sometimes with the addition of a few short silky bristles on the outside; sometimes reduced to a fringed ring or altogether wanting. Includes about 45 species natives of Europe, North Asia, the Mediterranean region and South America.

HYPOCHAERIS RADICATA L. Plant perennial, with a thick fleshy tap-root or with several fleshy roots. Leaves rosulate, applied to the ground, oblong-spathulate, toothed or sinuate-runcinate, hirsute and scabrous. Stems erect, thick and rigid, 2-9 diameter high. Involucre hemispherical with about 30 scales. Marginal ligules purplish externally. Achenes all with a long beak. (P) Europe and the Mediterranean region. March-June.-*Achyrophorus radicans* Scop.

Var. *neapolitana* D.C. Marginal achenes with a very short beak or without beak; the others with a long beak.-*Hypochaeris dimorpha* Ten.-H. *Tenorii* Guss.-H. *radicata* var. *heterocarpa* Moris.

HYPOCHAERIS CRETENSIS (L.) Boiss. Plant perennial. Radical leaves rosulate, pinnatifid or runcinate, with narrow segments, toothed or entire. Cauline leaves few, the upper small linear and entire. Tap-root thick. Stems several, erect or ascending, simple or usually corymbose-branched, hairy below, 1-4 diameter high. Heads rather small, involucre campanulate, involucre scales with one row of hairs along the keel, or even glabrous, acuminate, scarious and whitish along the margin. Outer florets one-half longer than the involucre. Marginal achenes with a fringed ring. (P) Southern Italy, Sicily, Greece, Crete. April-June.-*Seriola cretensis* L.

Var. *hispida* W. Involucral scales with several rows of hairs along the keel, and for the rest tomentose-farinose. Achenes all furnished with a plumose pappus. Stems glabrous or rarely hirsute. *Malta*, not common, Bugibba,

Saline, Bahar ic-Ciaghak, Gozo, Xlendi.-*Seriola cretensis* Biv., Guss.-*Fabera hispida* Sch. Bip.

**HYPOCHAERIS AETNENSIS** (L) Ces. P. et G. Plant annual, deep green, with a slender tap-root. Stems glabrous, usually branched above, 1-5 diameter high. Leaves more or less hirsute, toothed, oblong-spathulate; the lower sessile, sometimes ovate; the upper few and bract-like. Peduncles with 1-2 bracteoles, rarely with more. Flowers golden yellow, the marginal florets red on the outside, and about half longer than the involucre. Marginal achenes often with pappus of very short bristles. (A) Mediterranean region. April-May. *Malta, Gozo, Comino, Cominotto*, very common everywhere, along roads, on cultivated ground and on rocky wastes. *Seriola aetnensis* L.-*S. urens* All.-*S. hispida* Moench.-*Metabasis aetnensis* D.C.-*Hypochaeris serioloidea* Bert. M. Zigland.

### LEONTODON L.

Heads terminal, many-flowered. Scales of involucre imbricate in several series. Receptacle usually naked. Florets yellow. Achenes more or less beaked, striated longitudinally and rugose transversely. Pappus made of plumose bristles, flattened at the base, sometimes with a few short scabrous hairs on the outside, on the marginal achenes sometimes wanting or reduced to a small scaly ring. Includes about 45 species, natives of Europe, the Mediterranean region as far as Central Asia, and the Azores.

**LEONTODON TUBEROSUS** L. Plant perennial, with fascicled, fleshy, fusiform roots: green parts sparsely hairy, with hairs bifid or trifid. Leaves rosulate, sinuate-toothed or pinnatifid. Involucre purplish green. Central achenes with a long beak and with a plumose pappus, the marginal achenes also beaked but usually with a scaly ring instead of a plumose pappus. (P) Mediterranean region. September-March. *Malta, Gozo and Comino*, very common along roads and on waste and arid lands.-*Thrincia tuberosa* D.C.-*Picris tuberosa* All.-*Apargia bulbosa* Balb.-*A. tuberosa* W.-*Hyoseris tuberosa* Savi. The form: *Olivierii* Fiori.-*thrincia tuberosa* var. *Olivierii* D.C., with large heads and plant densely hairy; and the form: *isocarpus* Fiori.-th. tuber. var. *isocarpa* Bischoff, with marginal achenes similar to the central, and like them furnished with plumose pappus, are frequent with the species. M. Zigland.

### PICRIS L.

Heads many-flowered, in corymbs. Bracts of involucre imbricate, the outer usually shorter and spreading. Receptacle naked, pitted. Flowers yellow. Achenes fusiform, ridged longitudinally, rugose transversely, often incurved. Pappus deciduous, made of 2 rows of bristles connate at the base, the outer short and hair-like, the inner longer and plumose. Includes about 30 species, natives of Europe, the Mediterranean region, Temperate Asia and Abyssinia.

**PICRIS HIERACIOIDES** L. Plant biennial or perennial, more or less scabrous and hispid, with hairs simple or hooked. Stem angular, erect, simple or with spreading branches, 2-12 diameter high. Radical leaves petiolate, lanceolate,

toothed or sinuate; the cauline lanceolate, almost cordate or amplexicaul. Heads in corymbs or racemes. Scales of involucre linear-lanceolate. Flowers golden yellow, the marginal florets often reddish on the outside. (B) or (P) Europe and Temperate Asia; naturalised elsewhere.

Var. *spinulosa* Bert. in guss. Stem simple or slightly branched, making a dense inflorescence; plant more hispid and bristly, with narrow cauline leaves. Heads usually large, with a tomentose or bristly involucre. May-July. *Malta*, according to Delicata and Gulia.

### HELMINTHIA Juss.

Outer row of involucre bracts foliaceous, broad and spreading, the inner row of bracts narrow and more numerous. Achenes compressed, elliptical, transversely rugose, terminating in a long beak, which is very slender and fragile, breaking off along with the pappus. The rest as in *Picris*. Includes 6 species, natives of the Mediterranean region, the Canaries, Madeira.

**HELMINTHIA ECHIOIDES (L.) Gaertn.** Plant annual hispid, with hooked and forked hairs. Stem angular, 1-10 diameter high, with spreading branches from the base. Leaves oblong or lanceolate, entire or sinuate and toothed, the lower petiolate, the upper amplexicaul. Heads on slender peduncles in a corymbose inflorescence. Outer involucre bracts much larger than the others, ovate-acuminate; inner bracts narrow awl-shaped and acuminate. Flowers golden yellow, the outer slightly longer than the involucre. Pappus white. (A) Western Europe, the Mediterranean region, Canaries, Madeira; naturalised elsewhere. March-October. *Malta*, *Gozo* and *Comino*, frequent in fields and gardens, and also on uncultivated ground and in valleys; more common on clayey soils.-*Picris echioides* All.

Var. *tuberculata* Moench.-H. *mucronata* N. Terr. Stems thick and stiff, densely hispid, with rigid hairs. Outer involucre bracts hispid with rigid hairs, spine-scent and mucronate at the apex, mostly cordate at the base and hardly longer than the inner bracts. With the species at Boschetto and Rabato.

Var. *pratensis* Chev. Stems u.s., but almost glabrous. Outer involucre scales less mucronate, with shorter and softer hairs. Frequent in fields, among growing crops.

Var. *humifusa* Trevir. Stems slender, prostrate or ascending, almost glabrous. Outer involucre scales narrow, and shorter than the inner. Heads smaller. Here and there in fields, late in the season.-*Picris humifusa* W.

### UROSPERMUM Scop.

Heads many-flowered, solitary or almost corymbose. Involucre made of about 8 scales in one row, connate at the base. Receptacle pitted on raised papillae, which are hairy. Flowers yellow, becoming green when dry. Achenes compressed, curved, rugose, with a long pointed beak, jointed on

the achene. Pappus deciduous, made of plumose bristles connate into a ring at the base. Includes 2 species.

UROSPERMUM PICROIDES (L.) F.W. Schmidt. Plant annual, mostly bristly and hispid. Stem usually solitary and branched above, with 1-5 heads. Leaves thin and tender, oblong, the radical petiolate, the cauline amplexicaul, all more or less pinnatifid or runcinate. Heads large on long peduncles. Involucre urceolate, bristly, with lanceolate acuminate scales. Achenes with beak swollen at the base; pappus snow-white. (A) Mediterranean region, Madeira, Canaries; naturalised elsewhere. January-June. *Malta*, *Gozo*, *Comino* and *Filfolà*, common along roads, on heaps of rubbish, in fields and gardens, and on waste ground.-*Tragopogon picroides* L.-*T. aculeatum* Moench.-*Arnopogon picroides* W. M. Tgief xeuuieki.

The following forms are frequently met with; form: *calabrum* N. Terr., plant with spreading branches from the base, smaller leaves, peduncles becoming thickened near the base of the head; form: *asperum* D.C.-*Tragopogon asperum* L., with leaves almost entire, lanceolate or linear-lanceolate, stem usually simple, plant very bristly and almost spinescent; form: *glabrescens* A. Terr. Heads glabrous, and plant glabrous or almost glabrous.

UROSPERMUM DALECHAMPH (L.) F.W. Schmidt. Plant perennial, bristly and tomentose with curled hairs. Stems usually simple, bearing one head, or slightly branched near the base, 1-4 diameter high. Lower leaves petiolate, runcinate; the upper amplexicaul, oblong or ovate; higher up they are mostly entire or toothed; the uppermost opposed or whorled, rarely all entire. Heads larger than in the preceding species, on fistulose peduncles, thickened near the apex. Scales of involucre broadly lanceolate, tomentose, often margined red. Pappus reddish. (P) Mediterranean region. March-June. *Malta*, *Wied Balluta* and *Ta Xbiex*, according to *Delicata* and *Gulia*.-*Tragopogon Dalechampii* L.-*Arnopogon Dalechampii* W.

## GEROPOGON L.

Heads many-flowered, usually solitary, or few in a corymbose inflorescence. Involucre with one row of 8-9 scales, becoming spreading but not reflexed. Receptacle pitted, with scales on the outer side of pits. Flowers reddish. Achenes cylindroid, grooved, with long beaks, the outer bearing 5 long unequal rigid bristles, the inner bearing many plumose interlocked bristles. Includes only one species.

GEROPOGON GLABER L. Plant annual, slightly glaucous, glabrous, with a long tap-root, and an erect mostly simple stem, or sometimes slightly branched above, 2-8 diameter high. Leaves long, linear, acuminate, dilated at the base. Peduncles fistulous, becoming thickened towards the head. Heads comparatively small with linear-lanceolate bracts. Flowers pink or purplish red, shorter than the involucre. (A) Mediterranean region, Canaries, Madeira. April-May. *Malta*, not common, in fields and on waste grounds at *Fiddien*, *Melleha*, *Ghain Rihana*, *Ghain Mula*, *Gneina*, *Puales*, *Mistra*. The form:

*hirsutus* L., in which the plant is rather hairy at the nodes, is frequent in clayey fields at Wardia below Gebel Auzara.-*Geropogon australis* Spr.

### TRAGOPOGON (Tourn.) L.

Differs from *Geropogon*, by the involucre made of 5-16 scales connate at the base, and becoming reflexed at maturity: receptacle naked. Flowers yellow, rosy or purplish. Achenes more or less prismatic, very long, the marginal transversely spinescent and scaly, the central often smooth, all with similar plumose pappus. Includes about 24 species, natives of the Mediterranean region and Central Asia.

**TRAGOPOGON PORRIFOLIUS L.** Plant annual or biennial, glabrous or slightly flocculent, with a stem 5-13 diameter high, simple or slightly branched. Leaves amplexicaul, linear-lanceolate, broad, erect, acuminate, slightly crisp along the margin. Peduncles thick, club-shaped near their insertion with the head. Heads large, usually with 8 involucre bracts, which are longer than the flowers, often twice as long. Flowers violet-red or dark purple. Achenes with a long thick beak, with an apical callosity often hairy. (A) or (B) South Europe and North Africa. April-May. *Malta*, according to Delicata and Gulia.-*Tragopogon sativus* Gater. At present occasionally cultivated. E. Salsify. I. Salsefica, Salsifi. M. Lehjet il Botbot.

Var. *Cupani* Guss. in D.C. Leaves woolly in the axil, and dilated at the base into a wide sheath. Involucre bracts hardly longer than the flowers.-*Tragopogon pratensis* Zeraph non L. April-May. *Malta*, at Puales, according to Delicata and Gulia. M. Lehjet il Botbot.

### SCORZONERA L.

Heads many-flowered, solitary or in corymbose inflorescence. Scales of involucre imbricate in several rows. Receptacle naked. Flowers yellow or pink. Achenes all similar, fusiform, ridged, with or without a beak, smooth or scabrous. Pappus plumose. Includes about 100 species, natives of Central and Southern Europe, Northern Africa, and Northern and Central Asia.

**SCORZONERA LACINIATA L.** Plant annual, biennial or perennial, glabrous, or more or less whitish and pubescent, with a fusiform tap-root. Stems many, or rarely solitary, erect or ascending, fistulous, usually branched, 1-5 diameter long. Leaves with distant linear segments, the terminal segment being larger and linear-lanceolate. Heads cylindrical before flowering, or more or less with 8 angles; involucre scales often furnished with a tubercle or process below the apex, scarious along the margin, the inner much longer and lanceolate. Flowers pale yellow, the marginal reddish on the outside. Achenes smooth, glabrous; pappus dirty white. (A), (B) or (P) Central Europe and the Mediterranean region.-*Podospermum laciniatum* D.C.-*Scorzonera petiolaris* Lap-S. *paucifida* Lam.

Var. *intermedia* Guss.-*Podospermum intermedium* D.C. Plant annual or biennial with erect or ascending stems, often with long branches. Leaves with

lanceolate segments, the terminal much broader and more or less connate at the base with the next two; sometimes the other segments are much reduced or even wanting. Scales with or without the process below the apex. Flowers much longer than the involucre. March-April. *Malta*, frequent on clayey soils in the western part of the Island of Gneina, Ghain Tuffieha, Selmun, Wardia, Wied Bufula, Bingemma, Ghain Rihana, Wied Kannotta etc. *Gozo*, rather rare, in similar soils at Marsalforno, Ramla, Chambray, Rabato.

Var. *decumbens* Guss.-*Podospermum decumbens* B. *resedifolium* Gr. et Godr.-*Scorzonera octangularis* var. *decumbens* Ten. Plant biennial or perennial, with lyrate leaves, and roundish or oblong segments. Central stem erect, the laterals prostrate or ascending. Flowers longer than the involucre; scales without the process below the apex; involucre usually more or less octangular. March-April. *Malta* and *Gozo*, in the same localities as the preceding, more frequent and sometimes common.

### TARAXACUM (L.) Juss.

Heads many-flowered, solitary, on radical peduncles. Outer rows of scales of involucre much smaller than the inner, and often reflexed. Receptacle naked. Achenes oblong, more or less tetragonous, prolonged into a beak. Pappus white, with toothed hairs. Includes about 20 species, natives of the cold and temperate regions of Europe and Asia, extending into North America and Africa, one being native of the Cape of Good Hope.

TARAXACUM OFFICINALE Web. in Wigg. Plant perennial, glabrous or with long applied hairs, with a thick fusiform tap-root, and rosulate petiolate leaves of variable form, usually toothed runcinate or pinnatifid. Peduncles prostrate or ascending or erect, glabrous or cobwebby; heads large, with a glabrous involucre of linear-acuminate reflexed scales. Flowers golden yellow, the marginal purplish on the outside. (P) Europe, North and Central Asia, North Africa, North America, naturalised elsewhere. The typical form, flowering mostly in spring and summer, is sometimes cultivated, but is not native.-*Leontodon Taraxacum* L. E. Dandelion. I. Dente di leone, Pisciacane, Tarassacco. M. Cicueira salvagga.

Var. *minimum* N. Terr.-*Leontodon minimum* Brig.-*Taraxacum gymnanthum* D.C.-*Taraxacum megalorrhizon* Forskall. Plant flowering soon after the first rains, before the appearance of the leaves, but continues flowering throughout the winter. Leaves oblong, runcinate-pinnatifid. Outer involucre scales closely applied, and often with a process or callosity below the apex. Beak of achenes slender and longer than the achene. September-February. *Malta* and *Gozo*, common along roads, on fortifications, on waste ground and in valleys. Often collected and sold as chicory for salads, and also for use as cholagogue in affections of the liver.

### CHONDRILLA L.

Heads few-flowered, in corymbs or racemes. Involucre cylindrical, with few scales in 2 rows, the outer being much smaller. Receptacle naked. Flowers yellow. Achenes cylindroid, with 5 ridges, truncated and scaly at the apex,



from the centre of which arises a long slender cylindrical beak. Pappus white with toothed bristles. Includes 18 species, extending from Europe and the Mediterranean region as far as India and Siberia.

**CHONDRILLA JUNCEA L.** Plant perennial, with erect stems much branched from the base, where they are bristly and hispid, and branches with a rush-like appearance. Radical leaves rosulate, oblong, toothed or runcinate, dying off when the plant is in flower; cauline leaves smaller. Heads in small clusters of 2-5, forming loose racemes, with short and unequal peduncles. Involucre whitish and tomentose; outer scales oval, inner scales linear-acuminate. (P) Europe as far as Siberia, North Africa; naturalised in North America. May-June. *Malta*, rare, on the sandy lands at melleha Bay and at Ghadira in the same locality.

The plants so far known belong to the variety: *angustifolia* Doell., with very narrow linear or filiform cauline leaves, toothed or spinescent along the margin. I. Lattugaccio.

### SONCHUS (Tourn.) L.

Heads many-flowered, in a corymb-like inflorescence. Involucre cylindroid, urceolate, at maturity swollen at the base, with imbricate scales. Receptacle naked. Flowers yellow. Achenes without beak, obovate or elliptical, ridged, compressed on the dorsal side. Pappus white, light, with toothed bristles. Includes about 40 species, natives of Europe, Asia, Africa, New Zealand, and one spread all over the world.

**SONCHUS TENERRIMUS L.** Plant annual or biennial, rarely perennial. Stems erect or ascending, fistulose and angular, tender, much branched, glabrous or hairy above, 2-10 diameter high. Leaves mostly petiolate, very tender, glabrous, glaucous on the lower surface, with 2 acute ear-like processes at the base of the petiole, pinnatifid or bipinnatifid, with segments trapezoidal or of variable shape. Heads rather small, cottony at the base; involucre glabrous or rarely slightly hairy. Achenes lanceolate, convex on both surfaces with 5 ridges on each side, and rugose transversely. (A), (B) (P) Mediterranean region and Abyssinia. January-May. *Malta*, *Gozo* and *Comino*, common in fields and gardens, on walls and on rocky ground; sometimes is also in flower in summer. E. Sow-thistle. I. Cicerbita. M. Tfief.

The following forms are met with; form: *annuus* Lge. An annual plant, with simple slender stem, foliage pinnatifid; form: *pectinatus* D.C, leaves pinnatifid, plant perennial, with many angular stems; form: *Gussonei* Fiori, leaves bipinnatifid with divided or toothed segments; form: *italicus* Spt., leaves bipinnatifid, with narrowly linear segments entire or toothed.

**SONCHUS OLERACEUS L.** Plant annual or biennial, with erect and thick stems, very angular, glabrous or slightly hairy above. Leaves variable, rarely pinnatifid, usually undivided or runcinate; the lower petiolate, the upper usually sessile and furnished with ear-like appendages at the base. Heads and involucre u.s. Achenes obovate or elliptical, compressed. (A) or (B)

Cosmopolitan, in many varieties and forms.-*Hieracium oleraceum* Scop. E. Sow-thistle. I. Cicerbita, Crespino. M. Tfief.

Var. *levis* Bartal. Achenes not furnished with margin, with 3-5 ridges on each side, rugose transversely. Leaves tender, with spreading and acute appendages. Involucre naked or slightly hairy.-*Sonchus oleraceus* a. et b. L.-*S. ciliatus* Lam. *Malta*, *Gozo*, *Comino* and *Cominotto*, common everywhere in several forms more or less distinct. Flowers all the year, but chiefly in February-April.

Var. *asper* Hill. Leaves rigid and shining, with rigid teeth often spinescent; cauline leaves with roundish appendages recurved against the stem. Achenes furnished with margin, with 3 main ridges on each side, scabrous, but not rugose.-*Sonchus oleraceus* g. et d. L.-*S. spinosus* Lam. Flowers all the year. Common in fields and arid localities, in *Malta*, *Gozo* and *Comino*. The following forms are met with; form: *inermis* Bischoff, flowers pale yellow; leaves oblong, undivided or runcinate, with teeth not spinescent; frequent in fields and gardens; forms: *pungens* Bischoff, flowers u.s., leaves lyrate-runcinate, rigid and often curled, with spinescent teeth; common in fields and open localities,-*Sonchus Nymanni* Tin. in Guss.; form: *glaucescens* Jord. Flowers golden yellow or yellow, leaves more rigid, glaucous and more spinescent, deeply runcinate: achenes with a broad margin usually furnished with cilia.-*Sochus graecus* Reut.-*S. decorus* Lojac. Common in exposed situations and in sea-side places.

**SONCHUS ARVENSIS L.** Plant perennial, with an erect stem 3-9 diameter. High, simple or slightly branched, usually not angular. Leaves glaucous, toothed and spinescent, undivided or sinuate-runcinate, with very acute segments the lower petiolate, the upper usually linear, the cauline cordate at the base, with roundish or acute appendages u.s. Flowers deep golden yellow. Achenes with 5 ridges on each side, rugose transversely, brown or reddish. (P) Europe, Mediterranean region as far as Japan. March-May. *Malta*, rare, at San Antonio Gardens and in neighbouring fields and gardens; probably a recent introduction.

#### LACTUCA (Tourn.) L.

Heads in racemes, panicles or corymbs, usually small and sometimes few-flowered. Involucre cylindrical, with imbricate scales. Receptacle naked. Flowers yellow or blue. Achenes obovate or lanceolate, compressed, with scabrous ridges, prolonged into a beak which terminates in a knob on which is inserted a white pappus made of toothed hairs. Includes about 90 species, mostly natives of the Old World.

**LACTUCA SALIGNA L.** Plant annual or biennial, with a deep tap-root, and an erect whitish stem, simple or branched at the base, 3-10 diameter high, terminating in many racemes. Leaves not decurrent, hastate at the base, with 2 acuminate appendages applied to the stem, glaucous; the lower pinnatifid-runcinate, with entire or toothed segments, the upper undivided and narrowly linear. Heads with 8-10 yellow florets; outer scales of involucre oval-

lanceolate; the inner linear, often purplish at the back. Beak twice as long as the achene. Midrib of leaves spinescent on the lower surface. (A) or (B) Mediterranean region, Central Europe and Central Asia. July-October. *Malta*, frequent here and there, Valletta Glacis, Boschetto, Attard, Gnien il Cbir, Gnien Ingrau, Cottonera, Corradino: often common in fields and gardens near Attard. The form: Wallrothii Spr.-*Lactuca saligna* var. *Wallrothiana* D.C., with leaves not spinescent along the lower surface of the midrib, is met with at Attard and Boschetto. E. Willow Lettuce.

Var. *virgata* Trusch. Leaves all pinnatifid-runcinate, and spinescent along the nerves on the under surface, and often also along the margin.-*Lactuca saligna* var. *runcinata* Gr. et Godr.-*L. adulterina* Gren. Rare, in fields and gardens at Attard.

**LACTUCA SCARIOLA L.** Plant annual or biennial, 6 to 20 diameter high. Stems rather thick, smooth or bristly and prickly. Lower leaves oblong-obovate, mucronate-toothed, smooth or prickly. Lower leaves oblong-obovate, mucronate-toothed, smooth or prickly and bristly along the midrib on the underside, mucronate-toothed along the margin. Cauline leaves lanceolate, sagittate-amplexicaul, twisted on their base, and hence with vertical blade. Heads with several florets. Involucre u.s. Achenes brown, usually mottled olive, bristly or pubescent, but may be white, black or glabrous in the cultivated forms. (A) or (B) April-October. Europe, Central Asia, North Africa, Canaries, Madeira, naturalised in North America. E. Prickly Lettuce.

Var. *silvestris* Lam. Stems very bristly and spinescent below. Leaves bispid and spinescent on the under surface along the midrib, and toothed-spinescent along the margin. Upper leaves mostly runcinate and pinnatifid, more or less glaucous and rigid. Panicle pyramidal, loose, with few bracts. Flowers sulphur yellow, reddish on the outside. *Malta*; rather rare, at Ghirghenti; possibly also elsewhere, as it is easily mistaken for *L. virosa* L. M. Hassa salvagga.

Var. *sativa* L. Stems glabrous, leaves not spinescent along the midrib. Cauline leaves mostly entire. Panicle corymbose, rather dense and furnished with numerous bracts. Flowers yellow. Cultivated in many forms. E. Lettuce. I. Lattuga M. Hass.

**LACTUCA VIROSA L.** Plant annual or biennial, with an erect stem, simple or branched above, terminating in a large panicle or corymb-shaped inflorescence of racemes, glabrous or bristly below. Leaves large, oblong, the upper almost lanceolate, all spinescent along the midrib on the under surface, and at the teeth of the margin; usually undivided, or rarely slightly lobed and with reddish spot. Flowers sulphur yellow. Heads and involucre u.s. Achenes purplish black. (A) or (B) *Malta*, rather frequent in fields and gardens, and also in odd corners and in valleys. Gozo, rather rare, at Chambray and Rabato.-*Wiestia virosa* Sch. Bip. E. Wild Lettuce. I. Lattuga velenosa. M. Hassa salvagga.

**LAUNAEA Cass.**

Heads many-flowered in corymbs. Involucre oblong, with imbricate scales, of which the outer are shorter. Receptacle naked. Flowers yellow. Achenes almost, without beak, finely striated and slightly scabrous, with 4 teeth at the base directed downwards. Pappus white, very soft, with toothed hairs. Includes about 30 species natives of the Canaries, North and South Africa as far as India; 2 being natives of the West Indies.

**LAUNAEA RESEDIFOLIA** (L.) O. Ktze. Plant perennial, glabrous and glaucous, with a thick rootstock, and many erect angular stems, branched above. Leaves somewhat fleshy, pinnatifid; the lower or radical petiolate, the cauline sessile with 2 ear-like processes surrounding the stem. Segments linear, entire or toothed, mucronate, terminating in a white callosity. Heads rather small, borne at the apex of long peduncles furnished with bracteoles. The outer involucre scales ovate, the inner linear-lanceolate, all scarious along the margin and tipped white. Flowers twice as long as the involucre. (P) Spain, North Africa, Sicily. April-May. Gozo, rare, according to Gulia; locality not specified. Not found again by other collectors.-*Scorzonera resedifolia* L.-*Sonchus chondrilloides* Desf.-*Zollikoferia chondrilloides* D.C.-*Rhabdotheca chondrilloides* Schultz.

#### REICHARDIA Roth.

Heads many-flowered, solitary or in small corymbs. Involucre ovate, urceolate when in fruit, with imbricate scales more or less scarious along the margin, the outer being shorter. Receptacle naked. Flowers yellow. Marginal achenes reddish black with 4-5 angles and equal number of longitudinal grooves, deeply rugose transversely; inner achenes whitish, narrower, almost smooth. Pappus soft, snowy white, with toothed hairs. Includes 4 species, natives of the Canaries and the Mediterranean region as far as India.

**REICHARDIA PICROIDES** (L.) Roth. Plant mostly perennial, glabrous, smooth, glaucous, with erect or ascending stems more or less angular, simple or slightly branched or forked, 1-5 diameter high. Radical leaves petiolate, oblong, often curled; cauline leaves oblong-lanceolate, cordate and amplexicaul. Peduncles long, thickened close to the involucre, furnished with scales. Outer bracts of involucre cordiform at the base, lancolate; the inner almost linear, all with a narrow scarious margin. (P) or (A) Mediterranean region and the Canaries.-*Scorzonera picroides* L.-*Reichardia integrifolia* Moench. I. Lattughino, Caccialepre, Latticrepolo. M. Kanclita or Zigland.

Var. *vulgaris* Fiori. Plant perennial, radical leaves mostly pinnatifid, or runcinate; marginal florets often reddish on the outside. Flowers all the year. *Malta, Gozo, Comino, Cominotto, Selmun*. Common everywhere. The form: *Cupaniana* Fiori.-*Picridium vulgare* var. *Cupanianum* Nicotra, with entire radical leaves, is less common.-*Picridium vulgare* Desf.

Var. *intermedia* Fiori.-*Sonchus intermedium* Jan.-*Picridium intermedium* Sch. Bip. Plant annual, leaves sinuate-lobed or simply toothed, stem usually

solitary, marginal florets yellow on the outside, like the others. *Malta*, not common, in gardens and fields at Casal Attard and Boschetto.

#### MELITELLA Sommier.

Heads small, many-flowered, sessile, clustered to form apparently one large sessile head, surrounded by a rosette of radical leaves. Outer scales of involucre few and membranous, inner scales larger, gibbose on the outer side, concave on the inner side, becoming thickened and embracing the marginal achenes. Flowers all ligulate, similar and hermaphrodite; anthers shortly sagittate at the base. Achenes striated longitudinally furnished with a short beak. The inner ones oblong, compressed, narrowed at the base: the marginal thicker, prismatic, surrounded by the inner scales; pappus white, made of short unequal bristles, free and scabrous or slightly toothed. Includes only one species. A very distinct primordial or palaeogenetic genus.

MELITELLA PUSILLA Sommier. A small annual stemless plant, with a thick fleshy tap-root and rosulate leaves applied to the ground, glabrous or hardly hairy. Leaves entire, or runcinate or pinnatifid, attenuated towards the base, but becoming dilated at the base, surrounding the cluster of heads. Heads rarely solitary, usually in clusters of 2-8 or more, slightly rising above the ground or half-embedded in the soil. Outer scales 2-4, linear, very narrow; the inner ones more numerous, about 8, very gobbiose on the outside, coriaceous, with membranous apex, closely imbricate. Florets 25 or more, with hyaline pale yellow glabrous corollas, with abrupt, 5-toothed or crenulate ligules. Achenes whitish, striated longitudinally, more or less curved; the marginal ones partly similar to the others, partly brownish, more finely striated, and enclosed by the inner scales. Plant very bitter. First found by Dr. Sommier in Gozo at Nadur, between Wied ir-Rihan and Wied Bingemma on the 15<sup>th</sup> April 1906, and fully described and figured by Sommier in April 1907. In 1909 it was found by me at Wied Bingemma and at Wied Marsalforno, Gozo; and afterwards at Ghar Bittia, in a lane close to Torretta at Casal Dingli, *Malta*. In 1912 Prof. Borzi is said to have found it in Cyrenaica, on the plateau close to Derna. However, the identification of the plant at Derna is founded on a single incomplete and withered specimen, and at best, is doubtful. Both the genus and species are therefore special to the Maltese Islands.

Var. *laciniata* mihi. Plant larger, often exceeding 6 cm in diameter. Leaves more runcinate and lacinate, with more acute and more distant segments, and except the primordial ones never entire, mostly with reddish midrib. *Malta*, at Ghar Bittia close to Dingli. These characters are usually well retained under cultivation. The typical plant at Gozo grows on clayey soils; the variety at Malta grows on red soil.

#### ANDRYALA L.

Heads many-flowered, in racemes or corymbs. Involucre campanulate; involucral scales in one row, becoming reflexed, sometimes with a few outer smaller scales. Receptacle furnished with fibrils. Flowers yellow. Achenes truncated at the apex, more or less prismatic, with 10 ridges prolonged

upwards into as many small teeth. Pappus white or whitish, deciduous, with hairs scabrous above and plumose below. Includes about 12 species, natives of the Mediterranean region, Madeira and the Canaries.

**ANDRYALA INTEGRIFOLIA L.** Plant annual, softly tomentose, ashy-green. Stem rarely simple, usually branched, erect or ascending 1-8 diameter high. Lower leaves petiolate, obovate, toothed-sinuate or pinnatifid or runcinate: cauline leaves oblong-lanceolate, sessile, amplexicaul. Heads pendulous before flowering, in racemes or corymbs. Achenes brown or dark red, with paler or whitish ridges. (A) Mediterranean region.

Var. *undulata* Presl.-A. *dentata* Groves. Stems branched from the base. Involucre with or without glandular hairs; flowers sulphur-yellow or whitish, suffused red, slightly longer than the involucre. Leaves ashy-green, sinuate, toothed and wavy along the margin. Southern Italy, Sicily, Pantelleria and neighbouring islands. May-August. *Malta*, rare, naturalised in the gardens at Casa Leoni and neighbourhood.

Var. *sinuata* L.-*Rothia runcinata* Roth. Plant u.s. Lower leaves more or less deeply sinuate or runcinate-pinnatifid. *Malta*, rare, at Ghain Duieli.

#### CREPIS (Vaill.) L.

Heads corymbose or solitary. Involucre cylindrical or campanulate, with imbricate scales, the outer scales sometimes much shorter and forming an involucl. Receptacle naked or hairy. Flowers yellow or pink. Achenes all similar, fusiform, cylindrical or prismatic or somewhat compressed, striated, somewhat beaked at the apex. Pappus usually white and soft. Includes about 170 species, natives mostly of Europe, Asia and North Africa.

**CREPIS VIRENS L.** Plant annual, more or less bristly or almost glabrous. Stem strong, branched from the base, very angular, 2-8 diameter high. Radical leaves lanceolate or oblong, acute or acuminate, variously cut: upper leaves oblong, acuminate, amplexicaul. Heads small, erect before flowering and after. Involucre minutely pubescent, and often hairy and glandular, about 5 mm long. Outer scales linear or awl-shaped, closely applied, the inner longer, linear, with narrow scarious margin, glabrous inside. Flowers golden yellow, heads in large inflorescences. Achenes truncated at the apex, about 2 mm long, brownish yellow. (A) South Europe, Asia Minor as far as the Caucasus, the Canaries; naturalised in North America May-October. *Malta*, frequent in the Addolorata Cemetery and neighbourhood, rare elsewhere. The plants found mostly belong to the form: *dentata* Bischoff, with lower leaves sinuate-toothed, and cauline leaves toothed at the base or entire.-*Crepis polymorpha* var. *parviflora* Desf.-*C.virens* var. *parviflora* Arc.-*Crepis tectorum* Pollich.

**CREPIS BULBOSA (L.) Tausch.** Plant perennial, with slender creeping rhizomes terminating in a roundish tuber. Leaves radical, petiolate, tender, glabrous, glaucous, oblong-lanceolate, obtuse, mostly entire, but often toothed. Peduncles radical, slender, erect, 1-3 diameter long, hairy and

glandular near the apex, bearing only one head. Heads rather small; involucre cylindrical, glabrous or hairy, purplish-green, with imbricate linear scales. Flowers yellow. Achenes with few ridges, pale brown. (P) Mediterranean region. March-April. In sandy or light soils, more frequent in such places close to the sea. *Malta*, Notabile, St. Paul's Bay, Bugibba, Saline, Gneina, Imtahleb, Bahria, Marsascala, Birzebbugia. *Gozo*, Ramla, Wied Bingemma, Marsalforno, Kbaijar, Wied Korrot, Xlendi, Ta Harrax, Wied iz-Zeit, San Dimitri, Chambray; *Comino*, Kala Santa Maria, where it is very abundant; *Cominotto*.-*Leontodon bulbosum* L.-*Prenanthes bulbosa* D.C.-*Aetheorrhiza bulbosa* Cass.-*Hieracium bulbosum* W.

The form: *De Aquini Nicotra*.-*Leontodon De Aquini* Tin., with narrow lyrate-pinnatifid foliage, is frequent in *Comino* and at Imtahleb.

## HIERACIUM L.

Plant perennial, rhizomatose, herbaceous. Involucral scales in several series. Receptacle pitted, each pit surrounded by a toothed or ciliated or fibrillary short membrane, not prolonged into a scale enveloping each floret. Achenes all similar, cylindrical, striated or ridged, truncated at the apex; pappus reddish or whitish. Rarely snow-white, made of 1 or 2 series of toothed or plumose bristles, rigid and fragile. Includes about 400 species, mostly natives of Europe, but extending all over the Mediterranean region, Northern Asia, Japan, North America and the region of the Andes.

**HIERACIUM HOPPEANUM** Schult. Rhizome or stolon very reduced or wanting. Leaves entire or slightly toothed, lanceolate-spathulate, tomentose and whitish, greyish on the lower surface. Flower-scape simple bearing only one head. Outer involucral scales, 3-4 mm broad, oval or broadly lanceolate, obtuse at the apex, scarious along the margin, mostly pink, villous with blackish hairs especially at the base, glandular with blackish glands and with stellate hairs, as also the upper part of the flower-scape. Involucre hemispherical at maturity. Achenes reddish brown. (P) Oriental Alps, but extending into Southern Italy and Sicily. June-August. *Gozo*, very rare, according to Gulia, who mentions it under the name of *Hieracium macranthum* Ten.-H. pilosellaeforme Hoppe.

## MONOCOTYLEDONES.

### ORDER HELOBIAE.

### ALISMATACEAE.

Perennial, rarely annual, aquatic or bog herbs. Leaves usually radical, rosulate or fascicled with a petiole dilated and sheathing at the base, and an entire blade, with prominent parallel or convergent nerves, cordate or ovate-

oblong, or sagittate, in submerged leaves sometimes reduced to a phyllode. Stipules wanting. Flowers actinomorphic, hermaphrodite, rarely monoecious, in a raceme or a whorled panicle. Perianth of 6 segments in 2 series, the outer 3 herbaceous, the inner 3 petaloid, caducous, with imbricate or convolute aestivation. Stamens hypogynous, or periigynous, 6 or a multiple of 6. Ovaries more or less numerous, in whorls or forming a head, free, one-celled, each with one or two campylotropous ovules. Fruit a follicle. Seeds recurved, exalbuminous. Embryo curved.

The family includes 12 genera, with about 50 species, distributed in bogs, marshes, lakes and rivulets all over the world.

The Water Plantain (*Alisma Plantago-aquatica*) has acrid properties. The starchy rhizomes of species of *Sagittaria* lose their acidity by cooking and are used as food.

### ALISMA L.

Flowers hermaphrodite. Perianth of 6 segments, the 3 outer herbaceous and persistent, the 3 inner petaloid and caducous. Stamens 6, with dorsifixed anthers. Ovaries 9-12 or indefinite, free, on a discoid receptacle, with caducous ventral style, or rarely with an apical persistent style. Fruit an achene. Includes about 10 species, natives of Europe, North and Tropical Africa, Temperate and Tropical Asia, Australia and America.

**ALISMA PLANTAGO-AQUATICA L.** Perennial herb, glabrous, with tuberous rhizome; the emergent leaves, light green, with a long petiole, with lanceolate or ovate or oblong blade, acuminate. Flower-scape 2-6 diameter high, terminating in a branched ample panicle, with whorls of branches having bracts at the base, the branches bearing flowers on pedicels about 1 cm long. Internal segments of perianth obovate, entire; the outer divergent after flowering. (P) Europe, North and Temperate Asia, North Africa, Australia, Temperate America. May-August. *Malta*, along water-courses or in ponds, frequent but nowhere common. Imtahleb, Fiddien, gneina, Ghain Tuffieha, Gnien il Cbir, Boschetto, Ghain il Cbira, Ghirghenti, Wied Gherzuma, Bahria, Gnien Ingrau (Melleha), Gnien Fieres etc.-*Alisma Plantago* L. e. Water Plantain. I. Mestola, Mestolaccia. M. Bisbula tal ilma.

Var. *latifolium* Gilib. Plant large, with ample ovate or slightly cordate leaves. *Malta*, at Wied Bufula near St. Paul's Bay, and probably elsewhere.

### DAMASONIUM (Tourn.) Mill.

Flowers hermaphrodite. Perianth u.s. Stamens 6, anthers dorsifixed. Ovaries 6-8, connate at the base, terminating in a horn-like process, with a short style and lateral stigma. Fruit made of the carpels, connate at the base and diverging star-like, indehiscent and coriaceous, each with 2 or more seeds. Includes 3 species, natives of Western Europe, the Mediterranean region, South Russia and Central Asia.



DAMASONIUM ALISMA Mill. An annual or perennial herb, with narrow ovate leaves, rounded or cordate at the base, floating, 10-15 mm broad. Flower-scape 10-70 cm high, with one or more umbels, peduncles 2-3 cm long. Petals ovate, white with a yellow spot at the base. Stamens 6. Carpels 5-10 mm long. Ridged at the sides. Ovules 2 in each carpel. Seeds rugose-tubercled, about 2 mm long. (A) or (P) Western Europe, Mediterranean region, as far as Southern Russia and Central Asia. March-May. Frequent in pools, especially where the water collects on rocky ground in winter. *Malta*, San Paul tat-Targia, Wied Encita, Wied il ghasel, Bugibba, hark Hamiem. Gozo, Xlendi, Ta Cenc, Sannat, Imgiar ix-Xini.-*Alisma Damasonium* L.-*A. stellatum* Lam.-*Damasonium stellatum* Thuill.-*D. vulgare* Coss. et Germ.-*D. Damasonium* Asch. et Gr. All our plants belong to var. *Bourgaei* Coss, in which the plant is reduced in all its parts, the peduncles being less than 2 cm long.-*Damasonium vulgare* var. *compactum* Micheli.

## JUNCAGINACEAE.

Herbs perennial, living in marshy or moist places. Leaves semicylindrical or linear. Flowers hermaphrodite or dioecious. Perianth of 6 segments, in 2 series, herbaceous, sometimes wanting. Stamens 6, perigynous or hypogynous, sometimes reduced to 1, with extrorse anthers. Ovaries 3 or more, free, or more or less connate, one-celled, 1 or 2-ovuled. Ovules basilar, anatropous. Fruit made of distinct diverging follicles, or a capsule opening by the ventral suture of the connate carpels, or indehiscent. Seeds erect, exalbuminous, with a straight embryo.

This small family includes 4 genera, with about 15 species, natives of temperate and cold regions, only one being found in tropical and subtropical America. They have no economic uses.

### TRIGLOCHIN (Rupp.) L.

Flowers hermaphrodite, in a long raceme. Stamens short, with dorsifixed anthers. Ovaries 6, of which 3 are alternate and sometimes sterile and reduced to as many ridges, connate until they are ripe: stigmas 3-6, bearded. Fruit a capsule 3-6-celled, with one seed in each cell, dehiscing from the base upwards, remaining connate at the apex with the central axis. Includes 10 species, natives of temperate and cold regions.

TRIGLOCHIN BULBOSUM L. Stem slender 1-3 diameter high; bulb made of an aggregate of bulbils surrounded by a tunic of interwoven fibres. Leaves linear semi-cylindrical, rather short, somewhat fleshy, grooved on the inner surface. Flowers in a slender raceme becoming elongated and loose; pedicels subequal to the fruit and divergent, with 3 fertile cells or follicles, oblong, conical, subulate, thicker at the base than at the apex, 6-7 times as long as they are broad (P) Western France, South Europe, North Africa. March-April. *Malta*, frequent in moist localities, especially near the sea, as at

Wied ghomor, Pembroke Camp, Marsa, Ghain Rihana, Saline etc.-*Triglochin bulbosum* L. var. *Barrelieri* Auct.-*Triglochin Barrelieri* Lois.

Var. *laxiflorum* Guss. Flowers in autumn, September-November. Pedicels shorter than the fruit, and applied to the flower-scape after flowering. Plant more slender than the type, with leaves grooved on both sides. *Malta*, frequent in moist weedy localities and on uncultivated ground, as at Melleha, Marfa, Mensia, Marsascirocco, Wied Encita, Wied il Ghasel etc. Gozo, Wied Marsalforno, Xlendi, Ta Cenc. E. Arrow-grass.

## POTAMOGETONACEAE.

Herbs annual or perennial, with a jointed rhizome, living in fresh or brackish or salt water. Stem jointed, usually branched and rooting. Leaves submerged, or the upper ones floating, alternate, rarely opposite, entire. Stipules free or connate with the base of the petiole. Flowers in spikes with or without bracts, hermaphrodite or monoecious or polygamous. Perianth usually consisting of 4 calycine segments, or forming a 3-toothed cup in male flowers, or absent in the female flowers, or totally absent in hermaphrodite flowers. Stamens hypogynous or inserted on claws of perianth, 4 or 2, subsessile or sessile, or reduced to only one. Anthers various, 3-celled or 1-celled. Ovaries 1-6, 1-celled, 1-ovuled. Ovule orthotropous or campylotropous. Fruit sessile or pedicelled, coriaceous, indehiscent. Seed oblong, exalbuminous. The family includes 7 genera with about 50 species, distributed all over the world.

### POTAMOGETON (Tourn.) L.

Flowers hermaphrodite, greenish, in linear or head-like spikes. Perianth wanting. Stamens 4, subsessile, with anthers deeply cleft in two, with a scale-like connective. Ovaries 4, free, one-ovuled. Stigma sessile or subsessile. Achene with an epicarp somewhat fleshy, and a woody endocarp. Includes about 40 species, living in fresh water, rarely in brackish waters, all over the world.

**POTAMOGETON PECTINATA** L. Plant perennial, submerged, with opposed leaves, forming a sheath around the stem. Stem almost filiform, long, much branched dichotomously. Leaves linear, setaceous. Spathe connate with the sheath and extending as a bifid whitish process. Spikes with a long peduncle, made of several whorls of flowers, which are greenish. (P) almost cosmopolitan. February-March. *Malta*, very rare, San Paul tat-Targia, in pools with stagnant water, according to Gulia.

**POTAMOGETON NATANS** L. Plant perennial, with simple or slightly branched stem. Leaves alternate petiolate, with a long petiole: submerged leaves lanceolate or oblong and membraneous, or reduced to the petiole; upper leaves broader, floating and coriaceous, slightly cordate at the base. Spathe acuminate, up to 10 cm long; spike up to 8 cm long. Fruits 4-5 mm long, obtusely keeled. (P) In temperate and tropical regions all over the world.

February-March. *Malta*, very rare, in ponds of stagnant water at San Paul tat-Targia and Wied il Ghasel, according to Gulia. I. *Lingua d'acqua*.

Var. *fluitans* Roth. Floating leaves oblong-lanceolate or elliptical, restricted towards the base. Peduncles clavate and thicker than the stem. Fruits dark brown, 2½ mm long, markedly keeled. With the species, according to Gulia.

**POTAMOGETON CRISPA L.** Plant perennial, with compressed branched simple stem. Leaves alternate, all submerged, sessile or shortly petiolate oblong-lanceolate, wavy and crisp, and toothed along the margin, 3-nerved, membranous. Peduncles not thickened, about as long as the leaf. Spike few-flowered. Fruit with a long beak, with 3 keels. (P) Europe, Asia, Africa, North America and Australia. February-April. *Malta*, very rare, in ditches with stagnant water at Melleha, according to Gulia. E. Pond-weed. I. *Lattugaranina*.

No trace of any *Potamogeton* could be found by other collectors in the above mentioned localities, or anywhere else in the Maltese Islands. Prof. Gulia's statement is therefore ascribed to an error of diagnosis.

#### RUPPIA L.

Flowers hermaphrodite, on a peduncle at first enclosed in the sheath of the leaf, and then becoming elongated after flowering. Perianth absent. Stamens 2, anthers subsessile, with cells becoming separated, thus simulating 4 unilocular anthers. Ovaries 4, rarely more, at first sessile and afterwards becoming stipitate. Fruit a small drupe. Includes only one species.

**RUPPIA MARITIMA L.** Plant perennial, with a slender creeping rhizome, submerged. Stems many, filiform, much branched dichotomously. Leaves opposed or alternate, filiform or setaceous, with stipule-like sheaths at the base. Spikes terminal, with 2 flowers, rarely with 3-6. Fruits ovoid. (P) In salt or very brackish waters along the sea-coast in temperate and tropical regions. March-July. *Malta*, Marsacirocco, Marsa, Marsascala, St. Paul's Bay.

Var. *rostellata* Koch. Peduncles becoming only slightly elongated after flowering (2-6 mm), almost straight. Pedicels 4-10 times as long as the fruit, which is more apiculate than in the type. Plant slender, leaves very acute. *Malta*, with the type, especially at the Saline in the sea-water ditch round the salt-pans.

#### ZANNICHELLIA (Micheli) L.

Flowers monoecious, with the intrapetiolar stipules, one male and the other female. Male flower without perianth, anthers 1 or 2, with separated loculi each on a process simulating a filament. Female flower with cup-like perianth: ovaries usually 4, free, with a style and a peltate stigma. Fruit an achene, one-seeded, furnished with the persistent style shaped like a beak. Includes only one species.

ZANNICHEILIA PALUSTRIS L. Plant annual or perennial; stems filiform, jointed, branched, creeping and rooting or floating. Leaves linear-filiform, mostly in clusters of 3, with amplexicaul intrapetiolar stipules. Fruit sessile or almost sessile, 2-6 in umbel, oblong, compressed, often curved at the apex. (A) or (P) Cosmopolitan, November-May. *Malta, Gozo and Comino*, frequent in ponds and pools of fresh stagnant water.-Zannichellia dentata W.

Var. *pedicellata* Fries. Fruits stipitate; toothed on the dorsal side. With the species, and often replacing it. M. Harira tal ilma.

## NAJADACEAE.

Annual or perennial herbs living in salt water or in fresh water. Stems branched, more or less rhizomatose and rooting. Leaves alternate, distichous or opposite, often fascicled, linear, 1-3 nerved, entire or toothed at the apex, with a sheathing base, persistent or caducous; with membranous stipules, free or connate with the leaf-sheath. Inflorescence like a spadix, single or multiple, within the same spathe. Flowers hermaphrodite, monoecious or dioecious; sometimes solitary or in axillary clusters or in a spadix. Perianth usually wanting, sometimes tubular 4-lobed or denticulate. Stamens 1 or 2, sometimes 4 or 3, anthers 1-4 celled, sessile, or with a very short scale-like filament. Ovaries 1-4, free, one-celled, usually one-ovuled, each with 2 or 3 stigmas. Fruit a nut or utricle, sometimes a berry, indehiscent. Seed subglobular or ovoid. The family includes 4 genera with about 30 species, inhabiting fresh or salt water in temperate and tropical countries..

### POSIDONIA Koenig.

Flowers polygamous, in a spike made of spikelets with 3-7 flowers, of which the terminal is male and the others hermaphrodite. Spike and spikelets are surrounded by large foliaceous bracts. Perianth wanting. Stamens 3 with sessile extrorse anthers, borne on a thick scale-like beaked connective. Ovary solitary, stigma sessile stellate-papillose. Fruit drupe-like, olive-shaped. Includes 2 species, one native of the Mediterranean region and the western coast of the Iberian peninsula, and the other native of temperate Australia.

POSIDONIA OCEANICA (L.) Del. Plant perennial submerged, with a thick branched rhizome entirely covered by the fibrous residue of the base of former leaves. Leaves sheathing, ribbon-like, entire, in clusters of 5 to 10 at the apex of the branches, 6-10 mm broad, and up to 50 cm long, rounded at the apex, green or dark brown. Flower-scape dichotomous, 1-2 diameter high, shorter than the leaves. (P) Inlets and bays in the Mediterranean and on the eastern coast of the Spanish peninsula. Flowers in October; the fruits mature and are often cast up on the shore in March-April. *Malta, Gozo and Comino*, common in all our bays and harbours, especially on sandy bottoms. The leaves are cast up in large quantities by the rough sea in winter, and are used as litter for animals. The fibrous residues torn off from the rhizomes are also cast on sandy beaches and get rolled up by the waves into those familiar

sponge-like oval or round balls of various sizes. *Zostera oceanica* L.-  
*Posidonia Caulini* Koenig. E. Sea-Wrack. I. Alega. M. Alca.

## ZOSTERA L.

Flowers hermaphrodite, inserted alternately in 2 rows on one side of a flattened spadix, enclosed in the spathe-like sheath of the floral leaf. Perianth wanting. Stamens 1, anther usually 2-celled, with filiform rod-like pollen. Ovary 1, inserted on one side, spurred at the base, acuminate at the apex, terminating in a style cleft into 2 filiform stigmas. Fruit a membranous utricle, one-seeded. Submerged perennial plants, inhabiting the sea-coast in rather shallow waters, like the preceding. Includes 5 species broadly distributed in temperate regions.

**ZOSTERA MARINE L.** Rhizome slender, long, compressed, naked, rooting at the nodes: stems and branches slender 2-3 diameter long. Leaves green or brownish, up to 1 m long, 5 to 9 mm broad, ribbon-shaped, with a closed sheath without appendages, with 3 to 5 nerves, the outer nerves being far apart from the margin, rounded or rarely emarginate or mucronate at the apex. Fruit a membranous utricle, striated or grooved longitudinally. (P) Western Europe, the Mediterranean region, the Baltic, North America, New Zealand, Japan. April-August. *Malta*, on muddy bottoms, sometimes in very shallow water, frequent in most bays and inlets; common at St Paul's Bay, Saline, Kalet Malku, etc. *Gozo*, at Migiarro and Marsalforno. E. Sea-wrack. I. Alega. M. Alca.

**ZOSTERA MINOR NOLTE.** Plant u.s. Leaves long u.s., about 2 mm broad, emarginate at the apex, with a sheath always cleft at the top, with 2 appendages, with one principal nerve and 5-6 secondary nerves, of which the 2 outer are marginal. Spathe swollen. Utricle smooth. (P) Mediterranean region as far as South Russia, the Baltic, the Caspian, Western Europe as far as Scotland. April-August. With the preceding on muddy bottoms, but rather rare. *Malta*, St Paul's Bay at Irdum l'Abjad and Pualet, Saline, Marsamuscetto.-*Phucagrostis minor* Cavol.-*Zostera nana* Roth.-*Z. nodosa* guss. non Ucria.

## CYMODOECEA Koenig.

Marine perennial plants u.s. Flowers dioecious, axillary, solitary. The male with 2 large anthers, each with 4 cells, borne on a long process simulating a filament. The female with 2 ovaries, subsessile, prolonged into a style very deeply cleft in two ribbon-like stigmas. Fruit an indehiscent and bony achene, compressed, semi-oval. Includes 7 species, of which 5 inhabit tropical seas, one the northern seas and the other the southern seas.

**CYMODOECEA MAJOR Grande.** Rhizome cylindrical, purplish, with scars of leaves forming complete rings closely set. Leaves linear, ribbon-shaped, up to 5 diameter long, 1½ to 5 mm broad, toothed above, with 6 to 8 nerves, with

cylindrical cleft sheaths, and with appendages. Male flowers on a peduncle up to 1 diameter long. Fruit about 8 mm long. (P) Mediterranean region, the Atlantic coast of Africa as far as Senegal, and of western Europe as far as the bay of Biscay. April-July. *Malta*, on muddy bottoms, frequent at Marsa, Calcara, Misida, Santu Roccu (Marsamuscetto), St Paul's Bay, Saline, Kalet Malku, Marsascirocco. Gozo, at Migiarrro.-*Phucagrostis major* Cavol.-*Zostera nodosa* Ucria.-*Cymodocea aequorea* Koenig.-*C. nodosa* Asch. M. Alca.

## ORD. LILIIFLORAE.

### JUNCACEAE.

Annual or perennial herbs, caespitose or with a creeping rhizome. Stems cylindrical, usually simple and leafy, or shortened and giving off flowering shoots. Leaves alternate, linear, pointed, sheathing at the base, sometimes much reduced. Stipules wanting. Flowers hermaphrodite, sometimes diclinous, in a cyme or spike or head, rarely solitary, each furnished with a bracteole. Perianth of 6 pieces in 2 series, equal or unequal, similar, glumaceous, persistent, with imbricate aestivation. Stamens usually 6, hypogynous, inserted at the base of the segments of the perianth, rarely reduced to 3, with filiform filaments, and introrse 2-celled anthers. Ovary free, trilocular or unilocular, with a terminal simple style and 3 stigmas. Ovules 3 or many, erect, anatropous. Capsule 1-3 celled, loculicidal or septifragal. Seds 3 or many, small, rounded or angular or fusiform, with a dense usually fleshy albumen. Embryo basilar, radicle thick, interior.

The family includes 14 genera with about 200 species, mostly dispersed all over the world.

The rhizomes of *Juncus conglomeratus* and *J. glaucus* are used as diuretics. The stiff stems and making fish-traps and cheese-forms.

### JUNCUS (Tourn.) L.

Leaves, when present, cylindrical, very narrow, glabrous, with open sheaths. Flowers small in cymes or small heads, with or without bracts at the base of each flower. Segments of perianth connate at the base. Stamens mostly 6, rarely 3. Stigmas filiform. Capsule trigonous, 3-celled or 1-celled by arrested development of septa, loculicidal, many-seeded. Includes about 103 species dispersed all over the world.

**JUNCUS CONGLOMERATUS L.** Plant perennial; rhizome creeping. Stems caespitose, deep green, smooth, deeply striated or grooved when dry, with continuous pith, rarely hollow, rather soft, 3-12 diameter high, with pale rusty-coloured opaque sheaths. Inflorescence contracted in the form of a dense head. Flowers reddish green. Stamens usually 3. Capsule reddish-green, obtuse-emarginate, mucronulate. (P) Europe, temperate Asia and North Africa. April-June. *Malta*, in moist localities, very rare; Marsa, according to Delicata.

Var. *effusus* L.-*Juncus effusus* L. Inflorescence large, divided; capsule depressed at the apex. Stems 5-6 diameter high, weak, minutely striated when dry. *Malta*, in moist localities at the Marsa, according to Delicata.

**JUNCUS ACUTUS L.** Plant perennial. Stems densely caespitose, glaucous, with a creeping rhizome. Stems stiff and strong, full, acutely pricking, 3-15 diameter high, with shining rusty sheaths. Inflorescence rish, red or reddish, more or less globular; lower bract spinous. Capsule large, twice as long as the perianth, imperfectly 3-celled. (P) Western Europe, Mediterranean region, South Africa. California, South America, the Canaries, Madeira etc. March-May. In moist or sandy places usually not far from the sea. *Malta*, frequent and sometimes common, at St Paul's Bay, Imtahleb, Fiddien, Saline, Bugibba, Gneina, Ghain Tuffieha, Marfa etc. Gozo, Kala Dueira, Imgiar ix-Xini, Kala, Nadur, San Blas, Wied iz-Zejt, Ramla, Kbaijar, Xlendi etc. *Comino*, Kala Santa Maria.

All plants examined belong to var. *megalocarpus* Asch. et Gr. with a rather dense inflorescence, and large capsule 3-5 mm long, oval-oblong or oval-conical. E. Bullrush. I. Giunco spinoso. M. Simar.

**JUNCUS MARITIMUS LAM.** Plant perennial, green, with a creeping rhizome. Stems 3-10 diameter high, stiff, strong, full, but less acutely prickly; sheaths u.s. Inflorescence rish, pale, with long branches, subequal to the lower bract which is also less acutely prickly; pedicels with 2-7 flowers; anthers yellow; segments of perianth acute. Capsule about as long as the perianth, 3-celled. (P) Europe, Western Asia as far as Afghanistan, Africa, America, Oceania. May-June. In moist places close to the sea. *Malta*, rare, at Marsascirocco, Marsa. Gozo, at Ramla and Wied Ramla. *Comino*, Kala Santa Maria.

**JUNCUS ARTICULATUS L.** Plant perennial, glaucous, with a creeping or even stoloniferous rhizome. Stems slender, cylindrical, compressed, erect or ascending or prostrate, 1-9 diameter long. Sheaths pale, usually all prolonged into a leaf; leaves in the green state not or slightly striated longitudinally, becoming septate and nodose-articulate when dry. Inflorescence corymbose, loose, sometimes with flowers modified as buds. Perianth with segments acuminate and aristate. Capsule acute or cuspidate. (P) Europe, Asia, North and South Africa, North America, Madeira. March-June.

Var. *lamprocarpus* Ehrh. Stems and leaves smooth in the green state. Clusters or heads with 2-10 flowers. Perianth about 3 mm long; segments subequal, the inner more commonly obtuse. *Malta*, in moist places and valleys, frequent and often common, as at Wied Dalam, Birzebbugia, road to Imtahleb, Fiddien, Wied Gerzuma, Vallone Lia, Ghain Rihana, Wied il Ghasfurja etc. Gozo, Wied tar-Ramla. E. Bullrush. I. Giunco. M. Simar.

Var. *striatus* Schousb. Plant not stoloniferous: stems and leaves mostly striated when green. Heads with 10-20 flowers: segments of perianth all acuminate and aristate. Capsule very cuspidate.-*Juncus macrocephalus* Viv. *Malta*, with the preceding at Wied Dalam, and probably elsewhere.

**JUNCUS CAPITATUS** Weig. Plant annual. Stems caespitose, erect, filiform, angular, without nodes, 3-12 cm high. Leaves all radical, setaceous, grooved. Flower-heads solitary, rarely 2 or 3 together on the same stem, with one long bract at the base of each head; flowers greenish or reddish, without bracts, segments of perianth equal, smooth, the outer 3 being divergent and acuminate. Capsule ovate-globose, 3-celled, much shorter than the perianth. (A) Europe, North Africa, the Canaries and Azores, Abyssinia and Australia. March-April. *Malta*, in moist localities; very rare, at Ghain Mula and Boschetto.

**JUNCUS BUFONIUS** L. Plant annual, caespitose; stems 5-30 cm high, pale green. Radical leaves few linear-setaceous; cauline leaves 1-3, similar, without appendages. Sheaths greyish or reddish. Inflorescence with erect branches, a corymbose cyme, with solitary flowers, more or less far apart. Capsule oblong, shorter than the perianth; each flower bracteolate. (A) Cosmopolitan. March-May. *Malta*, *Gozo* and *Comino*, in moist localities and places which are humid at least during winter and early spring. The typical form is very rarely met with, as at Wied Kirda.

Var. *hybridus* Brot-Juncus *congestus* Schousb.-J. *bufonius* var. *congestus* Whlbn-Juncus *mutabilis* Savi. Flowers in a head-like inflorescence, or in dense clusters each with 2-5 flowers. Segments of perianth less acuminate. Capsule sometimes as long as the perianth. In moist localities and valleys; common in *Malta*, *Gozo* and *Comino*.

Var. *foliosus* Desf.-J. *bufonius* var. *fasciculatus* Armitage.-J. b. var. *major* Boiss.-J. b. var. *longifolius* Genn. Leaves longer and more numerous, soft, flat; stems higher. Segments of perianth very acuminate. The rest as in the typical form. Here and there in very moist valleys, *Malta*, at Boschetto, Ghirghenti and Ghain il Cbira.

Var. *Sorrentini* Parl. Flowers in dense heads more or less globose. Frequent in moist localities and along the margins of pools on rocky ground, in *Malta*, *Gozo* and *Comino*.

Var. *pumilio* Griseback. Stemless or almost stemless; flowers in dense clusters in the centre of the radical leaves, which are short and stiff. Very common in less moist situations and in rocky places, in *Malta*, *Gozo* and *Comino*.

## LILIACEAE.

Herbs perennial, very rarely annual, sometimes frutescent or arborescent, with a bulbous, tuberous, fibrous-fascicled root, or with a creeping rhizome. Leaves simple, entire, sheathing or amplexicaul. Flowers hermaphrodite, very generally actinomorphic, variously united in an inflorescence, sometimes solitary. Perianth inferior, petaloid, of 6 segments in 2 series, free or forming a tube with 6 lobes or teeth, with imbricate aestivation. Stamens 6, inserted on the receptacle or at the base of the perianth, with distinct filaments, with



introrse or extrorse 2-celled anthers. Ovary free, superior, trilocular, each cell with several or many anatropous or amphitropous ovules. Style simple, usually terminal; stigmas 3 more or less distinct. Fruit a 3-celled capsule, sometimes a berry. Seeds several or numerous, albuminous, of various types.

This large family includes 187 genera, with about 2,100 species distributed all over the world, principally in temperate and subtropical regions.

Many Liliaceae are cultivated for ornament, such as the Lilies, the Tulips, the Hyacinths, the Squills, the Hemerocallis, the Fritillariae etc. Others are extensively cultivated and used as vegetables, such as Asparagus, the Onion, the Leek, the Shallot, and Garlic; the tuber-like roots of *Asphodelus ramosus*, dried and powdered, furnish an excellent glue for saddlers and book-binder. Many species are medicinal or poisonous. Thus the bulbs and especially the seeds, of *Colchicum autumnale* contain the glucoside colchicine a powerful poison, and are used in gout and rheumatism. The rhizome of *Veratrum album* contains jervine and other alkaloids, closely allied to veratrine, another potent poison. The bulb of the sea-side squill (*Urginea maritima*) is an irritant poison, now much used for poisoning rats; it is also a valuable diuretic and expectorant. From *Aloe vera* and other species an inspissated juice is obtained, called aloe, and contains the bitter cathartic principle aloin, much used in medicine. The Lily of the Valley, *convallaria majalis*, contains in all its parts, a bitter glucoside, convalla-marine, which is a cardiac tonic. Sarsaparilla is the root of various species of *Smilax*, and is used as alternative and depurative; the roots and rhizomes of our *Smilax aspera* have the same properties in a lesser degree. The roots of *Asparagus officinalis* are diuretic. *Paris quadrifolia* is purgative and very poisonous. The bulb of the common onion is diuretic, slightly laxative and depurative, containing much sulphur, and affords a ready means to administer sulphur in an organic form. The same property is shared by other species of *Allium*. Garlic is very irritant in the raw state, and is a good vermifuge: it is also sometimes used externally as febrifuge and as a rubefacient.

#### TRIBE 1-MELANTHEAE.

Capsule usually septicidal. Flowers hermaphrodite or polygamous. Anthers introrse or extrorse. Carpels free at the apex, connate at the base, with 3 styles free or rarely connate at the base.

#### COLCHICUM (Tourn.) L.

Flower-scape very short, included within the sheaths of the bulb, bearing 1 to 2 flowers, rarely more. Bulb solid. Perianth funnel-shaped, with a long and slender tube, with limb divided into 6 oblong segments. Stamens 6, inserted on the throat of the perianth. Anthers introrse. Ovary 3-celled, with 3 long styles, entirely free. Capsule septicidal. Includes about 25 species, natives of Europe, North Africa, Western and Central Asia.

COLCHICUM CUPANII Guss. Bulb small. Leaves 2-3, linear-lanceolate, erect or falcate, developing along with the flowers. Flowers 1 to 4, very rarely more, perianth small, mauve, very pale pink or sometimes white, not variegated; limb 15-30 mm long, about 4 times shorter than the tube. Anthers purple. Styles suberect at the apex, about as long as the stamens. Capsule 13-20 mm long. (P) Italy, Sardinia, Sicily and the Balkan peninsula. September-November; soon after the first rain. *Malta*, *Gozo* and *Comino*, frequent and often very common on uncultivated or rocky ground in exposed situations.-*Colchicum montanum* L. p p. E. Meadow-Saffron.

The plants met with in the Maltese Islands belong to var. *Bertolonii* Stev. with linear-lanceolate leaves smooth or scabrous-ciliated along the margin, and lobes of perianth 18-25 mm long.-*Colchicum montanum* Bert.-*C. montanum* var. *pusillum* et var. *Cupani* Fiori.

## TRIBE II-LILIEAE.

Bulbous plants with flowers in raceme, or one or few on a scape, rarely almost umbellate and bracteate. Flowers hermaphrodite. Anthers introrse, or dehiscing laterally. Carpels wholly connate. Capsule loculicidal.

## TULIPA L.

Bulb tunicate; stem simple, usually one-flowered, with few linear or lanceolate leaves. Flower usually solitary, terminal, erect, with campanulate perianth, made of 6 free segments. Anthers basifixed. Ovary elongated, with sessile or subsessile stigma. Capsule oblong. Seeds numerous, flat or very compressed, with a large margin. Includes about 50 species, natives of temperate regions of the eastern hemisphere.

TULIPA SILVESTRIS L. Bulb ovate, with brown tunic, hairy on the inner side near the apex. Scape glabrous, 2-3 diameter high, naked above, bearing one flower, rarely two. Leaves 2-3 rarely 4, glaucous, linear-lanceolate, the lower broader. Flower yellow, with oval-lanceolate segments, all acute, without a basilar spot; inner segments broader. (P) Central and Southern Europe, North Africa, the Caucasus. E. yellow Tulip. I. Tulipano giallo selvatico, Tulipano bolognino. M. Tulipan salvagg.

Var. *grandiflora* Hy. Flowers pendulous when in the bud, and usually half-erect when in bloom; slightly greenish on the outside, segments 4-5 cm long, and 8-15 mm broad. Usually scentless. February-April. *Malta*, in fields at Wied Kirda, and at the upper end of Wied Encita. One of our finest native bulbs; flowers freely under cultivation.

TULIPA OCULUS-SOLIS St. Am. Tunics of bulb densely woolly on the inner side. Scape glabrous 3-4 diameter high. Segments of perianth subequal and acute, red, with a large black basal spot, margined yellow. Ovary usually

narrower at the apex. Leaves 3 to 4, ciliated along the margin, the lower ones broader. (P) South and Western France, Italy, Corsica, Western Asia. March-April. *Malta*, cultivated; sometimes almost naturalised in old gardens.- *Tulipa acutiflora* Poir.- *T. agenensis* D.C. E. Tulip. I. Tulipano. M. Tulipan.

*Tulipa Clusiana* Vent. Was formerly naturalised in several places in San Antonio Gardens, but has disappeared.

### LILIUM (Tourn.) L.

Plants with squamous bulbs, and very leafy stem or flower-scape. Flowers solitary, or few in raceme, terminal, erect or pendulous. Perianth campanulate or revolute; segments 6, free, with a nectariferous pit at the base. Anthers dorsifixed, versatile. Ovary sessile, with an elongated trigonous, entire stigma. Capsule obovate or subglobose: seeds many, very compressed, with a large margin. Includes about 45 species, natives of the temperate regions of the northern hemisphere.

**LILIUM CANDIDUM L.** Bulb large: basal or winter leaves 6-8, lanceolate. Stem 6-12 diameter high, with very many lanceolate leaves, decreasing in size upwards, with a minutely papillose margin. Flowers 5-20 in a short raceme, very large, erect, campanulate, revolute near the tip, pure white, smooth or shining on the inner surface, very sweet-scented. (P) Native of Asia Minor; naturalised elsewhere; long cultivated and perhaps the most beautiful of cultivated flowers. April-May. *Malta* and *Gozo*. Long cultivated, and often half-naturalised in old gardens, but never found in a really wild state, and rarely produces fertile seeds. E. Madonna Lily. I. Giglio, Giglio della Madonna. M. Gilju abjat.

### ORNITHOGALUM (Tourn.) L.

Plants with tunicate bulb and leaves all radical. Flowers in corymbs or racemes, with scarious bracts. Perianth of 6 segments, free or slightly connate at the base, white, mostly with green band or keel on the outside, or yellowish white. Anthers dorsifixed; filaments flat. Ovary with filiform style. Capsule membranous. Includes about 70 species, mostly natives of temperate regions of Europe, Africa and Western Asia.

**ORNITHOGALUM UMBELLATUM L.** Leaves linear, 1-8 mm broad, rarely up to 15 mm broad, and then furnished with a white band or keel. Bulb with numerous bulbils, outside or within the tunics. Flower-scape more or less naked at the base, and becoming slightly elongated after flowering. Peduncles 2-3 times as long as the bracts, becoming spreading or reflexed after flowering. (P) Central Europe, the Mediterranean region; naturalised in North America. March-April. E. Star of Bethlehem. I. Latte di gallina, Cipollone bianco. M. Halib it-tajr.

Var. *divergens* Bor.-*Ornithogalum refractum* Guss. Leaves about 6 mm broad, with a white band of keel, slightly longer than flower-scape. Bulb with leafless bulbils only under the outer tunics. Peduncles spreading, or more

commonly reflexed when in fruit. France, Italy, Sicily, Sardinia, Corsica, the Balkans and some of the Grecian Islands. *Malta*, rather rare, in fields and weedy localities at Wied Kirda, Boschetto and Wied Encita.

**ORNITHOGALUM ARABICUM L.** Bulb large, with many bulbils, inside or outside the tunics; leaves linear, about as long as or longer than the flower-scape, 2-2½ cm broad, without a white band. Scape 2-6 diameter high, naked, terminating in a short corymbose raceme, with 6-12 flowers, borne on erect or spreading peduncles longer than the bract. Flower large, pure white, segments obtuse, the outer mucronate, all without a green band or keel. (P) South Europe, North Africa, Madeira, Canaries; naturalised in Chili. April-May. Frequent and sometimes common in fields and on uncultivated and rocky ground. *Malta*, Ghirghenti, Ghain il Cbira, Dingli, Wied Babu, Wied Envita, Melleha, Marfa, Wied il Ghasel, Mistra etc. Gozo, Xlendi, Ta Cenc. *Comino*, rocky ground at Kala Santa Maria-Caruelia arabica Parl. E. Star of Bethlehem. I. Cipollone bianco. M. Halib it-tajr.

**ORNITHOGALUM PYRAMIDALE L.** Bulb ovate, without bulbils. Leaves linear, grooved, 5-12 mm broad, glaucescent or glaucous, shorter than the flower-scape, persisting till the end of the flowering period. Scape 2-4 diameter long; flowers white, very rarely greenish yellow, obtuse, with oblong-lanceolate segments having a green band or keel, 20 to 50, in a long pyramidal raceme, with erect peduncles up to 3 cm long and much longer than the bracts, which are acuminate. (P) Central Europe, Mediterranean region, Caucasus, Persia, Canaries. March-May.-*Ornithogalum brevistylum* Wolfn.

Var. *narbonensa* L.-*Ornithogalum lacteum* Vill. non Jacq.-*Scilla montana* Savi. Bracts very acuminate, usually as long as the peduncles, which are more or less spreading. Plant more slender or weaker, with narrower leaves and fewer flowers, the perianth of which does not become twisted after the blooming period. *Malta*, Gozo and *Comino*, frequent and often common, in fields as well as on rocky and uncultivated ground.

### URGINEA Steinh.

Plants with tunicate bulbs and radical leaves. Flowers in a raceme, rosy-white. Segments 6, free. Filaments filiform, cylindrical or rarely flattened at the base; anthers dorsifixed. Ovary with filiform style. Capsule membranous; seeds many in each cell, compressed, with a winged margin. Includes about 40 species natives of the Mediterranean region, Tropical and South Africa and the East Indies.

**URGINEA MARITIMA (L.) Bak.** Bulb large, more or less ovate or conical when young, globular or even depressed when fully grown, reaching 20 cm in diameter, white, with white or yellowish white tunics; or more or less ovate-conical purplish, with purplish tunic and rarely exceeding 12 cm in diameter. (form: *purpurascens* mihi). Flower-scape 6-15 diameter high with 50 or more flowers, making a long raceme. Leaves broadly lanceolate, 3-5 diameter long, and 5-10 cm broad. Flowers on pedicels 2-3 times as long as the

bracts, which are lanceolate, linear, gibbous at the base. Segments of perianth white, or very pale pink in the form with purplish bulbs, and then the scape is also more or less purplish, in both cases the segments are ovate-oblong with a green keel. (P) Mediterranean region, South Africa, the Canaries. August-September, flowering long before the leaves make their appearance. *Malta, Gozo, Comino, Cominotto, Selmun*, very common everywhere, especially on uncultivated rocky ground. The bulbs of the typical or white-bulbed form are cut into shreds, dried, and exported for medicinal and industrial uses. Both the white-bulbed and the purplish-bulbed form can be used in the preparation of extract for rat-poison. -*Scilla maritima* L.-*Urginea Scilla* Steinh. E. Sea-side Squill. I. Squilla. M. Ghansal or Ghansar.

## SCILLA L.

Flowers in racemes, rarely white, usually blue or rosy or purplish. Perianth with 6 segments, free or slightly connate in a tube at the base. Seeds subglobose, 1-2 or few in each cell. The rest as in *Urginea*. Includes about 80 species, natives of Europe, and temperate or mountainous regions in Asia and Africa, one being found in South America.

*SCILLA AUTUMNALIS* L. Leaves sub-cylindrical, grooved, 1-2 mm broad, shorter than the scape, which is from 5 to 20 cm long, with a raceme of 2 to 6 flowers, at first corymbose and then becoming elongated. Flowers small, 4-5 mm long, rosy-violet, rarely whitish or white, without bracts, on pedicels not shorter than the flowers or twice as long. (P) Central Europe, Mediterranean region, the Caucasus. September-October soon after the first rains, the leaves appearing when the flowers are fading. *Malta, Gozo and Comino*, very common in arid localities and on rocky ground.

*SCILLA PERUVIANA* L. Bulb more or less large, often with the formation of numerous bulbils on the roots. Leaves 6 to 9, lanceolate, herbaceous and fleshy, green. Flower-scape about as long as the leaf, or shorter, terminating in a dense corymbose raceme, with long pedicels. Bracts linear, whitish. Perianth of 6 free segments, spreading. Stamens in one series, inserted near the base of the segments. (P) Spain, Portugal, Italy, Sicily, North Africa. March-April.

Var. *sicula* Tin. Raceme corymbose-conical, with 50-100 flowers or more. Leaves 2-6 cm broad, minutely ciliated along the margin. Lower pedicels 4-6 cm long, subequal to the bracts which are slightly ciliated. Flowers dirty-white or ashy-white, tinted lead or very pale blue. *Malta*, in valleys and weedy localities, not common; at Wied Encita, Hagiar Kim, Wied Kirda, Melleha, Puales, Bingemma, Wied il ghasel, Boschetto. *Gozo*, at Imgiar ix-Xini. M. Ghansal ichal.

The form: *candida* Guss., with pure white flowers is very rare; at Wied Encita and Wied Kirda.

The form: *Clusii* Parl., with glabrous bracts and bluish-violet flowers, more or less deep, is also very rare; at Zenka (a branch of Wied il Ghasel). The plants

of *Scilla Clusii* existing in the public gardens have been originally brought from this locality.

**SCILLA HYACINTHOIDES L.** Bulb u.s. Leaves lanceolate-linear, 1-3 cm broad, shorter than the scape, minutely ciliated. Scape 3-6 diameter high, terminating in a long raceme with 50 to 100 or more flowers, on spreading pedicels 3-4 times as long as the flowers. Flowers bluish-violet 4-6 mm long. Ovary with 3 nectariferous pits at the base. The rest u.s. (P) Native of Western Asia; cultivated and naturalised in Southern Europe. *Malta*, at Melleha, St Paul's Bay, Wardia, according to Delicata and Gulia. *Gozo*, at Ta Cenc, according to Gulia. Must be very rare, as it was never again seen by others. -*Nectaroscilla hyacinthoides* Parl.

#### HYACINTHUS (Tourn.) L.

Flowers racemose, blue or whitish. Perianth funnel-shaped, and more or less campanulate, with tube sometimes urceolate or tightened above the ovary; lobes of perianth 6, subequal to the tube or shorter, erect or revolute. Stamens inserted on the tube or on the throat. The rest as in *Scilla*. Includes about 30 species, natives of the Mediterranean region and Western Asia; 3 being natives of Tropical and South Africa.

**HYACINTHUS ROMANUS L.** Flower-scape 15-30 cm high, shorter than the leaves, which are flaccid and prostrate, terminating in a long conical raceme of 20-30 flowers, furnished with scale-like bracts. Pedicels about as long as the perianth, which is dirty-white shaded blue towards the base during the blooming period, 1 cm long with 6 lobes, linear-oblong-obtuse, spreading, about  $\frac{1}{2}$  the length of the tube. Capsule tigonous, roundish, emarginate. (P) South Europe, North Africa, Cyprus. March-April. *Malta*, rather rare, at Imtahleb, Notabile, Boschetto, Fawwara, Musta; mostly on clayish soils. *Bellevalia romana* Rehb.

**HYACINTHUS ORIENTALIS L.** Leaves linear, grooved, more or less erect, subequal to the scape. Flower-scape 2-3 diameter high, terminating in a loose raceme of 2 to 10 flowers or more with very short pedicels and scale-like bracts. Lobes of perianth, about as long as the tube, recurved; tube very ventricose at the base. Stamens included, inserted half-way down the tube. Flowers hyacinthine-blue in the wild form; dark blue, white, red, pink or yellowish in the cultivated forms (P) Native of Western Asia; cultivated and naturalised elsewhere. March-April. *Malta* and *Gozo*, cultivated; the wild form is frequently cultivated and naturalised at Boschetto and in old gardens. E. Hyacinth. I. Giacinto, Granbrettagna. M. Giacinti.

The pure white form, blooming in January-March, known as Roman hyacinth, is also cultivated and sometime half-naturalised.

#### MUSCARI (Tourn.) L.

Flowers racemose, the upper ones sterile and undeveloped, blue, violet, rarely yellow, with scale-like bracts. Perianth urceolate-globose, contracted at

the throat, with 6 very short toothe-like lobes. Stamens inserted on the tube, included, in 2 series, with anthers almost basifixed. Style simple, rather short, with trilobed stigma. Capsule membranous, trigonous, winged at each angle. Seeds globose. 1 or 2 each cell. Includes about 40 species natives, of Europe and the Mediterranean region.

MUSCARI COMOSUM (L) Mill. Leaves green and somewhat fleshy, linear, grooved, 2-4 diamter long, 12-20 mm broad, about as long as the scape or longer. Raceme terminating in a corymbose cluster of sterile flowers, more deeply coloured blue, on longer pedicels. The raceme is at first conical elongated, with many flowers, afterward becoming more or less cylindrical. Fertile flowers with perianth shortly cylindrical or obovate-urceolate, greenish violet, 6-10 mm long, subequal to the spreading pedicels. (P) Central Europe, Mediterranean region, Canaries and Madeira. March-May. In fields and on weedy and uncultivated ground; common in *Malta*, *Gozo* and *Comino*. A fine pure snow-white form, (form: *candida mihi*) has been found in a field along the road to Imtahleb-Hyacinthus comosus L-Leopoldia comosa Parl.-Muscari segusianum Perr. et Song. E. Tassel Hyacinth, Grape-Hyacinth. I. Cipollaccio, Giacinto del pennacchio. M. Basal il Hniezer.

MUSCARI PARVIFLORUM Desf. Leaves linear, filiform, semi-cylindrical and grooved, 1-2 mm broad, as first erect and afterwards flaccid, shorter than the scape. Flower-scape filiform, erect, 1-2 diameter high, bearing a short loose raceme with 6-12 flowers, rarely more, on short pedicels. Perianth sky-blue, ovoid-urceolate, slightly sweet-scented. Sterile flowers reduced to 1 or 2, or wanting. Bulb proliferous. (P) Italy, Sicily, Greece, Asia Minor, North Africa, the Balearic Islands. September-November; flowers appearing along with the leaves. *Malta*, frequent in fields and valleys, Wied Encita, Wied Ghomor, Marsascirocco, Wied Ghar Dalam, Boschetto, Minsia, Wied il Ghasel, Imtahleb, Bahria etc.-Botryanthus parviflorus Kunth.

MUSCARI RACEMOSUM (L.) MILL. Leaves numerous, linear, grooved 2-3 mm broad, 15-30 cm long, longer than the scape or about as long, at first erect and afterwards flaccid. Flower-scape 10-15 cm high, bearing a short oval, dense raceme, with 12-30 flowers, on short pedicels, sweet-scented, intensely violet-blue, with apowdery bloom. Perianth ovate-oblong, 4-6 mm long, with white teeth. Sterile flowers few, pale blue, Capsule cordate, emarginate. (P) Central Europe and the Mediterranean region. March-April.-Hyacinthus racemosus L.-Botryanthus odoratus Kunth.-Muscari Gussonei Tod. The typical form is not met with in the Maltese Islands.

Var. neglectum Guss. in Ten.-Muscari speciosum March.-Botryanthus speciosus March. Plant more robust, with broader leaves having a larger groove. Capsule not emarginate. *Malta*, on uncultivated and rocky ground, and in fields, not common. Wied Filep a branch of Wied il Ghasel near dolmen, Naxaro San Paul tat-Targa, Wied Ghomor, Wied San Giljan. E. Common Grape Hyacinth.

#### TRIBE III-ALLIEAE.

Plants with tunicate bulbs, often inserted on a short rhizome. Flowers in umbel or head, with an involucre made of a membranous spathe, at first entire, and afterwards breaking into 2 or 3 valves. The rest u.s.

#### ALLIUM (Tourn.) L.

Plants with leaves all radical; leaves sometimes sheathing the scape for a considerable length; with a fetid alliaceous odour. Perianth of 6 segments, free or just connate at the base, spreading or campanulate. Stamens with their base more or less confluent with the perianth. Anthers introrse, dorsifixed. Ovary 3-locular or sometimes unilocular owing to arrest of septa. Style filiform, straight. Capsule membranous. Seeds 1 or 2 in each cell, roundish or angular and compressed. Includes about 250 species, mostly natives of Europe, and of temperate and cold regions of Africa, Asia, Abyssinia, Mexico and North America.

ALLIUM SATIVUM L. Bulb simple or proliferous, but without rhizome: bulbils ovate-oblong. Leaves linear, flat, narrow or broad, scabrous along the margin, more or less folded along their whole length. Scape cylindrical, leafy up to its middle, 5-7 diameter high: spathe with a long beak, much longer than the umbel: umbel bulbiferous, commonly made only of bulbils, or wanting. Flowers whitish, with smooth lanceolate-acuminate segments. Anthers included. (P) native of the desert regions of Central Asia; extensively cultivated. May-June. *Malta*, *Gozo* and *Comino*; cultivated, rarely found self-sown from dropped bulbils. E. Garlic. I. Aglio. M. Teum tal ichell.

Var. *Ophioscorodon* Don. Plant much larger and higher, with broader and stiffer leaves, more or less glaucous. Umbel large, flowering regularly, with or without the production of bulbils. Bulb much larger, with ovate-globose bulbils. *Malta*, occasionally cultivated.

ALLIUM SCORODOPRASUM L. Bulb proliferous with ovoid bulbils, without rhizome. Leaves flat, keeled or folded, glaucous, linear, scabrous along the margin. Scape u.s. Spathe with a short beak or without beak, shorter than the umbel. Umbel dense, with violet roundish bulbils and with many purplish or flesh-coloured flowers, having acute segments, the outer scabrous along the keel. Anthers included. (P) Central and Eastern Europe, the Caucasus and Asia Minor. May-June. *Malta* and *Gozo*; cultivated here and there, under the name of Teum ta ras hoxna or Teum ta Barbaria. I. Aglio romano, Rocambola.

ALLIUM AMPELOPRASUM L. Bulb proliferous with acrid flavour, and with yellowish bulbils. Leaves linear, keeled or folded 5-25 mm broad, glaucous or green. Scape u.s., 3-10 diameter high. Spathe beaked, with one valve, caducous, about as long as the umbel. Umbel dense, ovate, with many flowers, purple, rosy or whitish, with ovate-oblong segments, obtuse, more or less scabrous on the outside. Internal filaments broadly oval at the base. (P) Mediterranean region. April-May. *Malta*, *Gozo*, *Comino*, *Cominotto*, *Selmun*, *Filfol*, very common in rocky places near the sea, as well as in fields.-*Allium holmense* Mill.-a. *Bertolonii* De Notaris.-A. *Gasparinii* Guss.-A. *albescens* Guss. M. Currat Salvagg.



Var. Porrum L. Bulb simple or occasionally proliferous, with less acrid flavour. Umbel large, almost spherical; flowers white or purplish. Plant usually stronger. Commonly cultivated. E. Leek. I. Porro. M. Currat.

Var. melitense Somm. et Caruana-Gatto. Plant much smaller. Leaves narrow. Scape not longer than 2½ diameter. Umbel hemispherical, up to 3 cm in diameter. Filaments of internal stamens lanceolate or linear. *Malta*, endemic, at Boschetto.

ALLIUM SPHAEROCEPHALUM L. Bulb u.s. without rhizome, with the outer tunics entire. Leaves linear, semi-cylindrical, more or less grooved, fistulous at the base. Scape u.s. 2-12 diameter high. Spathe with one valve, more or less beaked, entire or becoming 2 or 3-cleft, usually caducous. Umbel more or less globose, dense, the outer flowers on pedicels about as long as the perianth, the inner longer; flowers purplish, very rarely rosy or white, with segments smooth or scabrous on the outside. (P) Central Europe and the Mediterranean region. May-June-*Allium descendens* Ten. non L.-*A. densiflorum* De Notaris. The typical form must be very rare or does not exist in the Maltese Islands.

Var. descendens L. non Ten. Bulb simple; leaves keeled, grooved. Umbel at first globose, then made of two parts, the lower or outer flowers sterile and pendulous, the central and fertile flowers erect on long pedicels.-*allium segetum* Jan.-*A. Rollii* A. Terr. *Malta*, rather rare, at Wied Hazir, Wied Znuber, Benghisa, Bahria, Corradino, Wardia, M. Teum cahiani.

ALLIUM OLERACEUM L. Bulb simple or proliferous, u.s. Leaves linear, grooved or flat above. Scape 4-8 diameter high, leafy up to its middle, about as long as the leaves or longer. Umbel with many flowers, bulbiferous. Spathe with one very long valve, usually much longer than the umbel, persistent. Segments of perianth oblong, obtuse, rosy, whitish or greenish. Stamens included. (P) Europe, temperate Asia, North Africa, Canaries, Madeira: sometimes cultivated as a vegetable or naturalised. The typical form is not met with in the Maltese Islands. E. Field Garlic.

Var. paniculatum L.-*A. intermedium* D.C. Leaves about 2 mm broad, semi-cylindrical, grooved. Scape 2-9 diameter high; umbel without bulbils, broad, with very unequal pedicels; spathe about 1½ times as long as the umbel. Flowers usually greenish-white, may be rosy, reddish, or white; segments of perianth oblong, very obtuse, emarginate or mucronate. May-June. *Malta*, here and there, frequent at Boschetto, ghirghenti, Ghain il Cbira, Imtahleb, Bahria, Wied Gherzuma, Gneina, Ghain Tuffieha, Wardia, ta Babu. Gozo, Nadur and Migiarro. May-June. M. Teum safrani.

Var. pallens L. Umbel more compact, without bulbils and somewhat globose, with short pedicels only slightly differing in length. Flowers whitish. Spathe about as long as the umbel. May-June. With the preceding variety, but less frequent, usually found in dry, arid localities.

Var. *renuiflorum* Ten.-*Allium paniculatum* Ten. non L. Umbel u.s., but more loose, and smaller, on a scape not exceeding 3 diameter in height. Spathe about as long as the umbel. Flowers rosy-white: perianth more cylindrical, with oblong-linear, acute segments. May-June. *Malta*, very rare, at Bahria according to Gulia.

**ALLIUM PARCIFLORUM** Viv. Bulb oval or oblong, solitary, with outer tunics membranous. Leaves cylindrical, filiform, narrowly grooved, longer than the scape, drying off at the flowering period. Scape flexuous, 1-3 diameter high, clad with the leaf-sheaths sometimes up to the umbel. Umbel with 3-12 flowers, with pedicels of varying length but not more than 3 cm long. Spathe tubular below, bifid at the apex, shorter than the umbel. Flowers rosy-purplish. Stamens included. (P) Corsica, Sardinia, and neighbouring small islands. June-July. *Malta*, frequent here and there; Boschetto, Pembroke Camp, Bahar ic-Ciaghak, Mghatab, Bugibba, Saline, Marfa. Gozo, at Wardija, Nadur, Zebbug. *Comino*, on hilly ground around Kala Santa Maria.-*Allium moschatum* Moris non L.

**ALLIUM CEPA** L. Bulb oblong, oval, pear-shaped, round or depressed, large, white or yellow or purple, usually solitary. Leaves cylindrical, fistulous, ventricose at the base, green or glaucescent, sometimes slightly compressed. Scape leafy at the base 4-10 diameter high, hollow, ventricose about its middle or below the middle. Spathe with 2 or 3 reflexed valves, about as long as the umbel. Umbel globose, many-flowered, dense. Flowers on pedicels 4-5 times as long as the perianth, which is white or slightly greenish, with ovate-lanceolate acute segments. Stamens long, exserted, usually with alternately toothed filaments near the base. (P) Native of Persia and Beloochistan. April-June. *Malta*, Gozo and *Comino*; extensively cultivated for home consumption and for export. E. Common Onion. I. Cipolla M. Basla, or Basal.

**ALLIUM ASCALONICUM** L. Bulbs ovate-elongated, multiple, aggregated, often forming large clumps. Leaves cylindrical, fistulous, slender, ventricose at the base, glaucescent. Scape cylindrical, hollow, about as long as the leaves. Umbel globose, compact, often bulbiferous, with pedicels hardly longer than the perianth, which is white or bluish, with oblong-lanceolate acute segments. Stamens slightly exserted, the inner 3 with filaments toothed at the base. (P) Native of Western Asia; cultivated; flowers only in certain years. *Malta*, occasionally cultivated as a kitchen vegetable. E. Shallots. I. Scalogno. M. Xalotti.

*Allium Schoenoprasum* L. (E. Chives. I. Erba Cipollina. M. Basal tal ksari or Basal tal insalata) is occasionally cultivated.

**ALLIUM GHAMAEMOLY** L. Bulb small, oval; rarely with bulbils or multiple. Leaves 3 or 4, flat or slightly grooved, spreading, 3-8 mm, broad, ciliated or villous, much longer than the scape. Flower-scape very short, 1-4 cm long, entirely embedded in the soil, and surrounded by the sheaths up to the umbel. Umbel at ground level, few-flowered, with a 2-4 lobed transparent spathe. Flowers white, occasionally reddish on the outside, with oblong-linear obtuse segments, 5-8 mm long, obtuse. (P) South Europe and North Africa. December-January. Frequent in arid, uncultivated or rocky places. *Malta*, on the Floriana

Glacis, Wied Encita, Corradino, Fort Manoel, Boschetto and Fakkania as far as Dingli, Bingemma etc. Gozo, Nadur, on rocky ground near Bingemma, Wied ir-Rihan, San Blas. E. Dwarf Moly. M. Teum kerkni.

**ALLIUM SUBHIRSUTUM L.** Bulb globose, proliferous, with pale yellow tunics. Leaves usually shorter than the scape, 2-8 mm broad, flaccid, grooved or keeled, very rarely entirely glabrous, usually ciliated along the margin, and often also on one or both sides. Scape cylindrical, covered with the sheaths only near the base. Spathe shorter than the umbel, ovate-acuminate, 2-3 lobed. Flowers entirely white, on spreading pedicels 1-3 cm long. Umbel with few or many flowers, without bulbils. Segments oblong-lanceolate, obtuse, 6-9 mm long. Stamens shorter than the perianth; style included. (P) Mediterranean region, Canaries, Abyssinia. March-May. *Malta*, *Gozo* and *Comino*, very frequent in fields, valleys, and on rocky and uncultivated land. M. Teum musuaf.

Var. *trifoliatum* Cyr.-*Allium graecum* D'Urv. Umbel with erect pedicels. Perianth rosy, at least along the keel of the segments which are lanceolate-acute. Stamens shorter, only half as long as the perianth. *Malta*, *Gozo* and *Comino*, with the typical form, but far less frequent.

Var. *subvillosum* Salzm.-*A. vernale* Tin. Umbel hemispherical with rigid pedicels, the outer ones slightly curved upwards. Segments of perianth white, oval-oblong, acute. Stamens and style exerted. April-May. *Malta*, not common; in batches on the rocky sides at Wied Gherzuma, and probably elsewhere. *Gozo*, at Ta Harra according to Gulia.

**ALLIUM ROSEUM L.** Bulb globose, proliferous, with tunics densely alveolate. Leaves u.s. glabrous, glaucescent, minutely toothed along the margin.. Umbel hemispherical, with few or many flowers, without bulbils; scape and spathe u.s. Flowers rosy or even reddish; segments of perianth 9-13 mm long, elliptical, sometimes minutely toothed. Stamens about the length of the perianth: style just longer than the stamens. (P) Mediterranean region. March-April. In fields, valleys and on uncultivated and rocky ground. *Malta*, frequent; Imtahleb, Wied Encita, Boschetto, Wied il Ghasel, Melleha, Marfa, Gneina, Wied Kirda, Wardia, St. Paul's Bay, Ghain Rihana etc. *Gozo*, less frequent; Xlendi, Imgiar ix-Xini, Sanant, Dahlet Korrot. *Comino*, on rocky ground near the Chapel and near the Hospital. E. Rosy-flowered Garlic, I. Aglio di serpe. M. Teum hamrani.

The form: *humile* Sommer, has a scape not higher than 2 diameter with flowers less than 8 mm long, and is frequent in arid and stony localities.

Var. *carneum* Targ-Tozz.-*Allium Tenorii* Spr.-*A. roseum* var. *bulbilliferum* Kth. Umbel with few rosy or reddish flowers and with bulbils: sometimes with bulbils only. With the typical form, but rare. *Malta*, Ghain il Cbira, Boschetto.

Var. *brachystemon* Red.-*Allium Tinei* Presl.-*A. permixtum* Guss.-Style twice as long as the stamens. Flowers white, becoming yellow when dry. *Gozo*, at Ta Cenc, according to Gulia.

**ALLIUM NEAPOLITANUM** Cyr. Bulb subglobose, proliferous, with pale yellow tunics. Leaves linear or linear-lanceolate, 7-20 mm broad, flat or slightly keeled. Scape erect, 2-4 diameter high, trigonous, with 2 angles acute and one obtuse. Umbel many-flowered, convex; with oval-acuminate spathe, one-valved; pedicels erect or spreading 15-30 mm long. Flowers milky white, with obtuse oval-elliptical segments 10-14 mm long. Stamens about half the length of the perianth. (P) South Europe, Asia Minor, Egypt. March-April. *Malta*, cultivated for ornament and naturalised in old gardens; also really indigenous according to Zerafa, Delicata and Gulia, *Malta*, Wied Balluta, Marsascala, Wied Hassaptan, Wied Blandun, Cottonera, Bahria; Gozo, Xlendi and Pergla.

**ALLIUM TRIQUETRUM** L. Leaves 3-10 mm broad, acutely keeled. Scape flaccid, often decumbent, 1-4 diameter long, with 3 very acute angles. Umbel small, with 6-16 flowers on unequal pedicels, at first pendulous, erect when in bloom; spathe caducous with 2 valves. Segments oblong-lanceolate. The rest u.s. (P) South Europe and North Africa; naturalised in England. December-april. In moist shaded places. *Malta*, very rare, Boschetto, Wied Gherzuma, Wied il Baruni. Gozo, also very rare, Xlendi, Migiarrro.

**ALLIUM NIGRUM** L. Bulb large, solitary, oval or subglobose, with entire tunics. Leaves 2 to 4, broadly lanceolate, glaucescent. Scape cylindrical, thick, 3-8 diameter high. Spathe oval, 2-4 lobed: umbel large, convex, dense, with pedicels 2 or 3 cm long. Flowers sweet-scented, white or slightly rosy, sometimes shaded green, with oblong obtuse segments 6-8 mm long, becoming reflexed. (P) Mediterranean region, Canaries, Mesopotamia. April-May. In fields, especially on Mesopotamia. April-May. In fields, especially on whitish and clayey soils. *Malta*, common, particularly in clayey fields in the southern and western part of the Island. Gozo, frequent, especially in fields with similar soils.- *Allium magicum* L. E. Black Garlic. M. Cioplais, Ciuplais.

Var. *multibulbosum* Jacq.-*Allium monspessulanum* Gouan. Bulb proliferous; leaves glaucous and broader. Segments of perianth more acute, white, often with a rosy keel. With the typical form in fields near Ghirghenti and Ghain il Cbira.

#### NOTHOSCORDON Kunth.

Leaves radical, linear, flat. Bulb tunicate, usually very bulbiferous. Scape simple, leafless. Spathe 2-valved, connate at the base: inner bracts small or wanting. Flowers many in terminal umbel; pedicels not jointed. Perianth persistent, marcescent, campanulate, segments 6 subequal, free or connate below their middle. Stamens 6, inserted on the base of the segments, included, on filaments more or less flattened, subulate and entire the at apex; anthers introrse, dorsifixed. Ovary 3-locular, style filiform persistent; stigma small. Ovules 6-12 or many. Capsule membraneous, trilobed, loculicidal. Seeds angular-compressed, black, membraneous or crustaceous. Includes about 10 species, natives of America and the Andes; one being native of China.

NOTHOSCORDERON INODORUM Asch. et Gr. Leaves many, more or less distichous, linear, glaucous, 15-30 cm long, about 1 cm broad. Scape 15-40 cm long, cylindrical, glaucous, naked. Flowers white, sometimes flushed rosy,

keeled. Bulb very bulbiferous, bulbils with or without leaves, conical, with a

pervades all parts of the plant, but the flowers are very sweet-

Native of sub-

-September.

and Go ; naturalised in many gardens, especially where there is irrigation: a troublesome pest for plants grown in pots: in many gardens at Lia,

exists also in the valley of Migiarro and along the Migiarro road in Gozo.-

inodorum Ait.-

-Notoscordum fragrans Kunth. N. borbonicum

Kunth. M. Teum tal ksari.

#### TRIBE IV. ASPHODELEAE.

Rhizomatose plants, mostly with a cluster of tubercles made of thickened roots;

reddish keel. Perianth regular, with free spreading segments. Stamens inserte

base, enveloping the ovary: anthers dorsifixed. Style filiform, with trilobed stigma. Capsule subglobose, trilobed, transversely rugose. Seeds 2 or 1 in , often rugose. Includes about 5 species, natives of the Mediterranean region, one extending into India.

ASPHODELUS RAMOSUS L. Plant perennial, robust, 5-10 diameter high, with fascicled roots, fusiform or napiform. Leaves green or glaucous, trigonous ensiform, all radical, 3- -7 cm broad. Flowers on solitary

flowering; pedicels 10-

bracts. Segments linear- ng, more or less acute, 18-

a greenish or reddish keel. (P) Mediterranean region, Canaries, Madeira, Switzerland. December-May. E. Branched Asphodel. I. Asfodelo, Porraccio. M. Berwiek.

Var. aestivus Brot. Asphodelus microcarpus Viv. A. affinis Parl.-

Scape much branched forming a panicle, with pale reddish bracts when young; base of filaments square; capsule small 5-6 mm in diameter, obovoid-

Mediterranean region, Canaries. Very common in valleys, on rocky and Malta, Gozo and sometimes forming extensive beds. To this variety belong all the plants hitherto examined.

ASPHODELUS FISTULOSUS L. Plant usually annual, slender, with fibrous and -cyl -30 cm long, 3-5 mm broad, scabrous along the margin. Scape branched, very rarely simple,

with loose racemes; pediceles 4-7 mm long, jointed about their middle, with small bracts. Flowers white or flesh-coloured, rotate or spreading; with segments 12-16 mm long. Filaments clavate above, hairy on their expansion at the base. Capsule u.s. 5-7 mm in diameter, rugose transversely with 2 or 3 wrinkles. (A) sometimes (B) or (P) Mediterranean region as far as Arabia and India, Nubia, Canaries, Madeira, Mauritius. February-May. *Malta*, rare, at Corradino, Misrah Suffara near Dingli, Ballut tal Wardia, Wied il Cbir near Pembroke Camp. E. Asphodel. I. Asfodelo, Porraccio. M. Berwiek.

Var. *tenuifolius* Cav.-*Asphodelus aestivus* Rehb. non Brot. Plant smaller in all its parts: leaves very narrow, very scabrous along the margin. Scape scabrous. Pedicels jointed below their middle; segments of perianth shorter, capsule smaller. *Malta*, Wied il cbir near Pembroke Camp.

### ALOE (Tourn.) L.

Flowers in racemes. Perianth tubular-cylindrical, deeply cleft in six closely applied segments. Stamens 6, hypogynous, with anthers dorsifixed-basifixed. Style filiform, stigma small. Capsule ovoid or oblong, with many compressed or angular seeds in each cell. Includes about 80 species, mostly natives of Africa.

ALOE VERA L. Stem thick and short, simple or rarely branched, usually with many off-shoots at the base. Leaves fleshy, closely set, gladiate, 45-65 cm long, broad, concave on the upper surface, thorny along the margin, pale or yellowish green, young leaves often with white spots. Scape axillary, 6-10 diameter high, simple or branched; with yellow hanging flowers on short pedicels in dense racemes, with lanceolate bracts. Perianth 2-3 cm long. Stamens and styles exserted. (P) Native of Eastern tropical and Northern Africa, Arabia and India: cultivated and naturalised elsewhere. April-June. In rocky and arid localities. *Malta*, at Ta Baldu, Pualet, Marfa, Boschetto. *Gozo*, at Imgiar ix-Xini on the slope towards Ta Cenc *Comino*, on a hill near Rala Santa Maria and at Bejn il Cmiemen.-*Aloe barbadensis* Mill.-a. *vulgaris* Lam. E. Aloe. I. Alie comune. M. Zabbara.

In the form: *rubescens* D.C., frequent at Boschetto and at Imgiar ix-Xini, the leaves are flushed rosy or purple.

ALOE VARIEGATA L.. native of South Africa, frequently cultivated in gardens, is becoming naturalised in the Verdala Park at Boschetto.

*Yucca filamentosa* L., *Y. gloriosa* L and *Y. flaccida* Haw., all natives of North America, are frequently cultivated and often met with half-wild in old gardens.

### TRIBE V-ASPARAGEAE.

Herbaceous or suffrutescent plants, never bulbous, with an underground rhizome and with fascicled roots, sometimes fleshy or nodose: stems sometimes spinous or voluble, with leaf-like or needle-like cladodes. Flowers

hermaphrodite, rarely dioecious or monoecious. Anthers with introrse or lateral dehiscence. Fruit a berry.

### ASPARAGUS (Tourn.) L.

Perennial herbs or suffruticose, with very branched stems; leaves reduced to scales or spines; with sterile branches (cladodes) acting as leaves. Flowers axillary, dioecious or polygamous, or all hermaphrodite. Perianth campanulate, with 6 segments free or just connate at the base, connivent or spreading at the apex. Stamens 6 hypogynous; anthers dorsifixed. Ovary 3-celled, each with 2 or 3 rarely up to 8 ovules: style columnar; stigma trifid with divergent lobes. Berry globose, red or black, with 1 to 4 seeds. Includes about 100 species, natives of temperate and hot regions in the eastern hemisphere.

ASPARAGUS OFFICINALIS L. Stems more or less erect, 6-15 diameter high: young stems sweet and eatable. Cladodes setaceous and awl-shaped, in clusters of 3 to 9, very slender, smooth, up to 25 mm long. Leaves abortive, slightly spurred at the base. Flowers polygamous or dioecious, on solitary or paired pedicels 6-12 mm long. Perianth of male flowers smaller than the female: segments white with a green keel. Ovules 2 in each cell. Berry globose, red, 6-10 mm in diameter (P) Central Europe, Mediterranean region, Central Asia. April-June. *Malta*, cultivated as vegetable for the sake of its young stems: often met with self-sown and practically naturalised in gardens.-*Asparagus hortensis* Mill.-a. *altilis* L. E. *Asparagus*. I. *Asparago*, *Sparagion*. M. *Sprag*.

ASPARAGUS APHYLLUS L. Plant low, suffruticose, with rigid branches, angular and scabrous. Cladodes rigid, spiny, in bundles of 2 to 6, usually 7-25 mm long. Stems often up to 15 diameter long, very much branched, slightly voluble; lower leaves spurred and spinescent. Berry blackish. (P) Mediterranean region and the Canaries. March-May. *Malta*, *Gozo*, *Comino* and *Cominotto*; common in valleys and on rocky ground, as well as along walls of fields. The young sprouting stems are eatable like the true *Asparagus*-*Asparagus acutifolius* Zeraph. non L. E. Thorny *Asparagus* I. *Asparago spinoso*. M. *Sprag xeuuieki*.

In the form: *abbreviatus* Sommier et Caruana-Gatto, the cladodes are only 4-5 mm long, but strong and stiff; in the form: *elongatus* Somm. et C. Gatto, the cladodes are long up to 25 mm and are more or less flexible.

Var. *stipularis* Forsk.-*Asparagus horridus* L. f. Cladodes mostly solitary, except at the apex of the branches, thick and 2-3 cm long, stiff or flexible. Stems longer; berry bluish-black. *Malta*, rare, at Wardia, Boschetto and Wied Encita.

ASPARAGUS MEDEOLOIDES Thunb. Stems very voluble, green, cylindrical, with slender spreading branches, and fascicled fleshy roots. Leaves scale-like. Cladodes solitary, ovate, acute, subcoriaceous, with silky lustre, light green, rounded at the base. Flowers in clusters of 1 to 4, on pedicels jointed above their middle. Perianth white, 4-6 mm long, with spreading segments. Berry globose, trilobed, red. (P) Native of South Africa; cultivated for its elegant foliage, much

used for table decoration etc. *Malta*, cultivated: naturalised in the hedges at San Antonio Gardens, at Casa Leoni, Boschetto etc. March-April. The stems are annual, and are pushed up early in autumn.-*Medeola asparagoides* L.-*Myrsiphyllum asparagoides* W. The form: *myrtifolia* Hort. with much smaller cladodes, 3-6 mm broad, is also cultivated.

#### RUSCUS (Tourn.) L.

Suffruticose plants with underground rhizome, and erect stems with scale-like leaves, and leaf-like cladodes, coriaceous, horizontal owing to basilar torsion. Flowers dioecious, inserted on the cladodes. Perianth of 6 greenish segments, the 3 inner smaller. Male flowers with 3 stamens, connate into a fleshy tube, on the summit of which there are 3 anthers with divergent cells. Female flowers also furnished with the staminal tube, but without the anthers, and within there is the ovate-globose trilocular ovary, with 2 ovules in each cell, and with a capitate subsessile stigma. Berry globose or oval, red, with 1 or 2 globose seeds. Includes 2 species natives of Central Europe, the Mediterranean region and the Caucasus.

RUSCUS HYPOPHYLLUM L. Stems usually simple, 2-5 diameter long. Leaves inserted in the middle of the under surface of the cladodes; cladodes oblong or oblong-lanceolate, not spinous, 5-10 cm long; the lower usually opposed, the upper alternate. Flowers 3-6, in small umbels: floral bract or leaf small, scarious. (P) Central Europe, the Mediterranean region, Caucasus and Madeira. December-April. *Malta*, cultivated for ornament; naturalised in the Boschetto, Ghain il Cbria and Ghirghenti; possibly a true native. E. Butcher's Broom. I. Linguette, Bislingua. M. Belladonna.

*Ruscus aculeatus* L. is frequently cultivated.

#### TRIBE VI-SMILACEAE.

Thorny, climbing shrubs, furnished with tendrils; leaves with 3 to 5 reticulate. Flowers dioecious. Fruit a berry. The rest as in Asparageae.

#### SMILAX (Tourn.) L.

Flowers dioecious. Perianth of 6 spreading segments, the inner 3 being smaller. Male flowers with 6 stamens. Female with oblong ovary, trilocular, with 1 or 2 ovules in each cell; stigmas 3, sessile. Berry globose with 1 to 3 globose seeds. Includes about 187 species, broadly dispersed in tropical and temperate regions.

SMILAX ASPERA L. Stems climbing, very long, with angular flexuous very spiny branches. Leaves coriaceous, hastate or cordate at the base, triangular-elongated, often spiny along the margin and along the nerves on the lower surface, frequently spotted white or dotted black, with tendrils inserted on the base of the petiole. Flowers dioecious, in axillary or terminal spikes made of many-flowered small sessile umbels. Perianth white, with 6 spreading segments, the inner smaller. Stamens 6. Stigmas 3. Berry red, globose, with 1 to 3 seeds. (S) Mediterranean region as far as India and



Abyssinia, Canaries, Madeira, Azores. September–November. *Malta*  
*Gozo*  
*angustifolia* D.C., with very narrow leaves, is found along with the typical form  
 -  
 Bindweed. I. Smilac, Rogocervone, Salsapariglia nostrale, Straccia brache.  
 M. Salsa pajzana.

Var. *mauritanica* Poir. Pl  
 rounded, usually without white spots. Here and there with typical form; *Malta*  
 at Wied Gherzuma, Bahria, Gneina, Boschetto, Ghirghenti, Melleha etc.  
*Gozo* -Xini.

## AMARYLLIDACEAE.

Per  
 roots. Leaves radical, entire, sheathing at the base. Flowers hermaphrodite,  
 enclosed in a spathaceous bract, solitary or umbellate on a scape rarely in  
 r, petaloid, more or less deeply divided into 6  
 segments in 2 series, often bearing at the throat a petaloid crown. Stamens  
 conniving at the base, with introrse 2- Ovary inferior, trilocular,  
 with a simple style having a simple or trilobed stigma. Ovules numerous,  
 -celled capsule, sometimes an indehiscent berry.

includes 65 genera, with about 650 species broadly distributed in  
 warm and temperate regions.

Many Amaryllidaceae are cultivated for their beautiful flowers or for their  
 -resin with  
 properties. *Amaryllis* Belladonna, *Haemanthus toxicaria*, *Narcissus*  
*Pseudo-Narcissus* etc. are poisonous. *Agave rigida* var. *sisalana* and  
*Fourcroya gigantea* are largely cultivated for the production of fibre. From the  
 a sugary liquid is obtained, which  
 on fermentation yields the spirituous drink called plaque, much used in  
 razor-

ng or horizontal, in an umbel enclosed in one spathe. Perianth  
 tubular, with 6 subequal lobes, spreading or reflexed, with a cup-like corona at  
 the throat, usually short but sometimes long and tubular. Stamens 6, inserted  
 the perianth, often at varying height, with  
 dorsifixed anthers. Style filiform with trilobed stigma. Capsule membranous.

region, one extending or naturalised in China and Japan.

**NARCISSUS SEROTINUS L.** Bulb small, globose, with bluish tunic. Leaves developing after the flowers, rush-like, filiform, grooved. Scape cylindrical, slender 1-2 diameter high, bearing one or two flowers. Perianth with narrow lobes, white, oblong or oblong-linear, acute or mucronulate, star-like: crown very short, trifid, yellowish. (P) Mediterranean region. September-November, after the first rains. *Malta*, frequent and often common on uncultivated and rocky land, in valleys etc. wied Encita, Boschetto, Dingli, Ta Laurenti, Tal Ghoja, Marsascirocco, Saline, St. Paul's Bay, Wardia, Pualet, Melleha, Ahrax, Ghain Tuffieha, wied gherzuma, Corradino etc. *Gozo*, not frequent, Ta Cenc and Nadur. *Comino*, not frequent.-*Hermione serotina* Haw. M. Rangis imuahhar.

**NARCISSUS TAZETTA L.** Bulb oval or pear-shaped, with yellowish-brown tunic. Leaves linear, usually erect, tape-like, flat, glaucous or glaucescent, sometimes grooved, developing along with the flowers. Scape usually with 3 or more flowers, angular-cylindrical or angular-compressed, rarely subcylindrical. Crown cup-shaped,  $\frac{1}{2}$  to as long as the lobes of the perianth, entire or crenate-lobed, usually yellow, with margins slightly incurved. Perianth usually white. (P) Mediterranean region; naturalised in eastern Asia. October-March. *Malta*, *Gozo* and *Comino*, common or very common in fields, valleys and on uncultivated ground.-*Narcissus neglectus* Ten. E. Narcissus, French Daffodil. I. Narciso, Tazzetta. M. Rancis or Rangis.

The form: *italicus* Ker-Gawl.-*N. praecox* Ten., with yellowish-white perianth, oblong-lanceolate lobes, and pale yellow cup, flowering in November-January; the form: *papyraceus* Ker-Gawl., with pure white flowers and intensely glaucous leaves; the form: *aureus* Lois. with yellow flowers and deeper yellow cup, as well as other forms, are frequently cultivated, and are sometimes met with naturalised in gardens. Such is also the case with *Narcissus incomparabilis* Mill of western Europe.

## PANCRATIUM L.

Flowers erect, in umbel, with a spathe made of one or two valves. Perianth funnel-shaped, with tube of various length, and with 6 erect-spreading lobes. Stamens 6, inserted on the throat of the perianth, the filaments being united at the base by means of a petaloid false crown, lobed at the margin: anthers dorsifixed. Style filiform, with simple stigma. Capsule oval-globose, trigonous. Includes 12 species, natives of the Mediterranean region, the Canaries and the East Indies.

**PANCRATIUM MARITIMUM L.** Bulb large, round or roundish, with black tunic. Leaves developing after the first rains, linear, glaucous, 10-15 mm broad, 2-4 diameter long, twisted spirally. Scape thick, compressed, as long as the leaves. Flowers white, in umbels of 3 to 10 subsessile, very sweet-scented. Perianth 10-13 cm long, with a long tube. Stamens with filaments united to the false-crown for a considerable length: false crown tubular, with 12 triangular lobes, for its lower third connate with the lobes of the perianth. (P) Mediterranean region. July-September. Chiefly on sandy beaches, out of the reach of the waves. *Malta*, common in the various inlets of the Marfa and

Ahrax, and at Melleha; frequent at St Paul's Bay, Saline, Gneina, Ghain Tuffieha. , common at the Ramla, frequent at Kbaijar. *Comino* at Kala Santa Maria. E. Sea-bahar or Pancrazu salvagg.

## AGAVE L.

Plants with persistent fleshy leaves, and fibrous roots: scape tall, clad with almost funnel- with tube adhering to the ovary for some length. Stamens 6, inserted at the base of the -lobes, and much longer than the lobes: anthers dorsifixed. Style -trilobed stigma. Capsule elongated, trigonous. Includes species natives of Central America.

AGAVE AMERICANA L. Rhizome large, with off- linear, convex on the under surface, grooved of the upper surface, flat glaucous. Scape 6 8 m high, with hard and scarious bracts, terminating in a large pyramidal inflorescence with compressed branches. Flowers yellowish, places along the Mediterranean littoral. naturalised at Boschetto, Addolorata Cemetery, Blata il Bajda, melleha, Notabile etc. , naturalised at Migiarro and Xlendi. naturalised near the Lazzaretto. The form: variegata Hort. with leaves having yellow bands, i typical form, and often entirely replaces it. E. Century-

naturalised itself at the Boschetto and Blata il Bajda, producing besides numerous off shoots, huge numbers of bulbils on the inflorescence as soon as the flowering is over.

## IRIDACEAE.

Perennial herbs with tuberous or bulbous rhizome and with herbaceous stem, -scape, sometimes much Leaves usually radical, sheathing, distichous, ensiform or linear, entire, flat or folded or grooved. Flowers hermaphrodite in a spike or corymb spathaceous bracts. Perianth superior, petaloid, tubular with 6 segments in 2 sometimes persistent, with contorted aestivation. Stamens 3, opposite to the outer segments of the perianth, epigynous, or inserted on perianth or at its base: filaments distinct or almost monodelphous: anthers 2- -locular, petaloid, entire or cleft. Capsule trigonous or trilobed, trilocular with loculicidal fleshy or cartilaginous albumen.

The family includes 57 genera with over 700 species broadly distributed in temperate and tropical regions.

The rhizome of *Iris florentina* when fresh is a strong purgative; when dry it is a stimulant of the respiratory and digestive organs, and is used in perfumery under the name of orris-root. The rhizomes of *Iris germanica* and *I. pallida* were used as diuretics and purgatives. The rhizome of *Iris foetidissima* was used for the treatment of scrophula and hysteria. The tuberous bulb of *Gladiolus segetum* was used as emmenagogue and aphrodisiac. The stigmas of *Crocus sativus* furnish the Saffron of commerce, which is a well-known colouring agent, and acts also as an emmenagogue and as a gastric excitant. Many Iridaceae are cultivated for ornament, vying with Orchids in their artistic shapes and vivid colours.

#### TRIBE I-CROCEAE.

Bulbous plants, with regular funnel-shaped perianth, having subequal lobes, all erect-spreading. Stamens equilateral. Stigmas trumpet-shaped or linear, bifid or multifid.

#### CROCUS (Tourn.) L.

Bulb solid. Leaves linear with revolute margins and with a white line. Scape very short. Flowers one or few, enveloped in membranous spathes. Perianth funnel-shaped, with a very long tube, and with 6 oval-oblong lobes. Stamens 3 inserted on the throat, with basifixed anthers. Ovary trilocular; style filiform with 3 long stigmas trumpet-shaped at the apex, sometimes lacinate. Capsule trigonous, loculicidal; seeds many, globose. Includes about 60 species mostly natives of the Mediterranean region, a few extending into Central Europe and Central Asia.

**CROCUS LONGIFLORUS Raf.** Bulb with finely reticulated net-work tunics. Leaves linear, 2-6 mm broad, about 2-5 cm long, glabrous, developing along with the flowers in autumn, or soon after. Spathe one-valved. Flowers one or two, sweet-scented. Perianth more or less deep violet, with a yellow throat slightly hairy. Anthers about as long as the stigmas which are yellowish-orange, toothed-multifid. Filaments white, shorter than the anther. (P) South Italy, Sicily Dalmatia and Tunisia. October-December. *Malta*, on uncultivated and rocky ground, Casal Dingli, Ta Laurenti, Boschetto, Imtahleb, Fakkania, Tal Ghoja.-*Crocus odorus* Biv. The form: *melitensis* Herbert (Reuter), met with at Boschetto, has a perianth of a deeper purplish violet with darker veins. The form: *albiflorus* mihi, with pure white or light lilac perianth is occasionally met with at Tal Gholja. E. *Crocus* I. Zafferano selvatico. M. Zaghfran selvagg.

**CROCUS SATIVUS L.** the true Saffron, is sometimes cultivated, as at Ghemieri, where it tends to become naturalised on rock ground.

#### ROMULEA MARATTI.

Bulbous plants with radical linear-recurved, and much longer than the scape. Scape mostly branched, short. Flowers solitary, in the axil of 2 spathaceous bracts. Perianth f -shaped,

stigmas, bifid, revolute, papillose on the inner side. Bulb solid. Capsule as in Crocus. Includes about 28 species, natives of the Mediterranean region and

ROMOLEA COLUMNAE Seb. et Maur. Bulb solid, small, with coriaceous

the sides; the lower spathe herbaceous, the upper more or less scarious. Perianth small, 1 -25 mm long, pale violet or whitish, sometimes white, with -acute lobes, with a yellowish throat: lobes often greenish outside,

inside. Stigmas filiform, with 3 bifid lobes, not higher than the anthers.

February- *Malta, Gozo, Comino, Cominotto, Islet of Selmun*; very -*Ixia parviflora* Salisb. *romulea minima* Ten. *R. parviflora* Bub. non Ecklon.

Var. *Rollii* Parl. Leaves very long, cylindrical filiform, tortuous and applied to the ground. Upper valve of spathe wholly scarious. Flowers larger, usually sea: *Malta*

Julians, Bahar ic- *Gozo*,

-*Ixia ramiflora* Ten. Leaves cylindrical compressed laterally; long, often erect. Both valves of spathe herbaceous, or the u with a very narrow scarious margin. Scape with long, one- *Malta, Gozo Comino*:

larger than in the typical form, deep violet or deep lilac, with narrower and

from the sea. *Malta*

Melleha. *Gozo*

*Comino*.

-Zejt, Wied Bingemma,

ROMULEA BULBOCODIUM Seb et Maur. Bulb and plant u.s. Leaves u.s. -25 mm long, purplish lilac with yellow throat, entirely violet lilac, or rarely violet, with purplish or yellowish line, and w

France, Abyssinia. February- *Malta*, according to *Delicata* and

plants collected are reported to be near the var. *Linaresii* Parl. in which the

-IRIDEAE.

Plants rhizomatose or bulbous. Perianth regular, with unequal segments, the outer 3 being recurved and the inner 3 narrower and erect or incurved. Stamens equilateral: stigmas dilated and petal-like.

### IRIS (Tourn.) L.

Plants rhizomatose or bulbous, with gladiate or linear leaves, distichous, sheathing and equitant. Flowers solitary or in panicles, furnished with spathaceous bracts. Perianth tubular at the base, usually large. Stamens 3, inserted at the base of the outer segments and covered by the petaloid stigmas. Ovary oblong, with 3 many-ovuled cells. Style triangular, almost wholly connate with the perianth tube: stigmas 3 petaloid, arched, bilabiate, with the upper lip much larger and bifid. Capsule cylindrical or with 3 or 6 angles, loculicidal. Seeds round or compressed. Includes about 100 species, natives of Europe, North Africa, temperate Asia and North America.

IRIS FLORENTINA L. Rhizome thick, creeping, violet-scented when dry. Leaves gladiate, equitant, acute, glaucous, all radical or rarely with a cauline leaf, 15-25 mm broad. Stem erect 4-7 diameter high, with 3 or 4 flowers on short branches, accompanied by boat-shaped bracts, the lower bract being herbaceous. Flowers surrounded by two bracts wholly scarious at the flowering time. Perianth white or very pale violet, sweet-scented, rarely unscented, with a tube a little longer than the ovary, with the outer segments furnished with a yellow beard, all with a yellowish claw or lined with violet. (P) Mediterranean region: frequently cultivated. March-May. *Malta*, cultivated for ornament, occasionally naturalised, as at Boschetto and Verdala Park. E. Florentine Iris. I. Giaggiolo. M. Iris abjad, Fleur-de-Lis.

Var. *pallida* Lam. Rhizome u.s. Leaves longer and broader, smoother. Stem 6-12 diameter high, with floral bracts entirely scarious and silvery. Flowers on longer branches, pale violet-blue, very sweet-scented, with darker veins; tube of perianth subequal to the ovary. Cultivated, naturalised in the Boschetto Gardens and in other gardens.

Var. *sicula* Tod. Rhizome and plant as in the preceding variety, but with slightly darker violet-blue flowers. Bracts scarious only along the margin, at the time of flowering. Flowers sweet-scented. *Malta*, rare, at Wied il Hesri, Makluba, Misrah Ghonok close to Wied il Ghasel. Gozo, also rare, at Munxiar (Sannat) and in the valley of Xlendi. A true native. The plants in the public gardens have been brought originally from Xlendi.

IRIS GERMANICA L. Rhizome u.s. Leaves smaller, less acute; stems 3 to 8 diameter high, with several flowers scented or unscented, on shorter branches. Floral bracts scarious down to their middle, at the flowering period. Perianth intensely violet. The rest u.s. (P) Central Europe and the Mediterranean region. March-May. *Malta*, frequently cultivated and naturalised in many places. A true native, being found at Wied Babu, Wied il Ghasel, ghain Cbira, Wied il Hesri, Imtahleb, -Iris benacensis Kern. E. German Iris. I. Giaggiolo. M. Fiurdulis ichal.

Var. *strata* mihi. Plant with reduced foliage, 1-2 diameter long. Stem 1½ to 3 diameter high. Flowers smaller, on very short branches, and of very deep violet-blue colour. Bracts u.s. *Malta*, rare at Musta and Misrah Ghonok.

IRIS PSEUDO-ACORUS L. Rhizome thick, oblique. Stem 5-10 diameter high, more or less cylindrical, branched. Leaves about as long as the stem, gladiate, linear acuminate, green. Flowers yellow, unscented. Tube of perianth much shorter than the ovary: segments all beardless; the outer broadly oval with reddish veinings at the base; the inner much smaller, narrower than the stigmas. Ovary and capsule trigonous. (P) Europe, the Mediterranean region as far as the Caucasus. April-June. *Malta*, cultivated in gardens; formerly a true native in the ditches below the Sakkaja at Notabile. Xiphion Pseudo-Acorus Shrank. E. Yellow Water-Iris. I. Giglio giallo, Coltellacci.

IRIS FOETIDISSIMA L. rhizome thick; leaves u.s. green, tetid. Stem simple 4-8 diameter long, compressed. Flowers dirty yellowish-violet. Tube of perianth very short; outer lobes oblong, livid violet with yellow claw; inner lobes smaller, dirty yellow: stigmas of same colour; all lobes beardless. Ovary and capsule trigonous. (P) Europe, the Mediterranean region as far as the Caucasus. March-May. *Malta*, very rare, at wied Encita and in the Boschetto valley. Cultivated and naturalised in gardens.-Xiphion foetidissima Parl. E. Fetid Iris. L. Giglio dei morti.

IRIS SISYRINCHIUM L. Bulb made of two collateral ones, with fibrous roots. Stem flexuous ½ to 1½ diameter long. Leaves 2, cauline, narrowly linear, grooved, longer than the stem, recurved. Flowers 2 to 5, fugacious, violet or pale violet, with a yellow or whitish spot in the middle of the outer reflexed lobes of the perianth; inner lobes erect and smaller than the outer. Tube of perianth filiform, subequal to the ovary. Claws of segments subequal to the limb, those of the outer lobes having a pubescent line. (P) Mediterranean region. March-May. *Malta*, *Gozo* and *Comino*: common in exposed rocky and arid localities.-*Moraea sisyrinchium* Ker-Gawl.-*Gynandris Sisyrinchium* Parl. E. Spanish-nut Iris. M. Fiurdulis salvagg.

Var. *sicula* Tod.-*Moraea sicula* Tod.-*iris maculata* Tod.-*Gynandris sicula* tod. One long leaf: lobes of perianth with numerous small spots; the outer lobes with very short claw. *Malta*; *Boschetto*, *Bahria*, *Wied Encita* and *Wied il Ghasel*: not common.

IRIS XIPHIUM L. The Spanish Iris, is commonly cultivated, and is sometimes met with as an escape from gardens.

#### TRIBE II-GLADIOLEAE.

Bulbous plants, with unilateral spikes of flowers. Perianth zygomorphic. Stamens arched and unilateral. Stigma filiform, dilated towards the apex.

#### GLADIOLUS (Tourn.) L.

Leaves linear, gladiate, 1-2 cm broad. Flowers in a unilateral spike, each with a spathe formed of 2 unequal pieces. Perianth with short tube, sub-bilabiate, with 6 lobes; the lower 3 having a white linear spot surrounded by a purplish margin. Stamens 3, inserted on the throat of the tube. Ovary 3-locular, with filiform style, having 3 spatulate stigmas. Capsule trilocular, loculicidal. Seeds winged or more or less globose. Includes about 90 species, natives of Central Europe, the Mediterranean region, tropical and South Africa and the Mascarene Islands.

**GLADIOLUS COMMUNIS L.** Bulb with tunic made of reticulate fibres, forming a netting with narrow and elongated meshes. Leaves linear-gladiate. Stem 5-9 diameter; flowers deep violet-red, 4-5 cm long, united in a unilateral spike of 7 to 10 flowers; lower segments equal, upper segments subequal. Capsule oblong-obovate; seeds broadly winged. (P) Central Europe and the Mediterranean region. March-May. The typical form is not known to exist in the Maltese Islands. E. Common Corn-flag. I. Fil di spada, Pancacciuola. M. Habb il kamh.

Var. *byzantinus* Mill. Spike more or less unilateral distichous, with 6 to 10 flowers: lower middle lobe of the perianth longer and broader than the others. In fields among growing crops and in ravines; not common. *Malta*, fields at Dingli, Fakkania, Rabato, Bahria. *Gozo*, at Xlendi.

Var. *dubius* Guss.-*Gladiolus illyricus* Koch. Spike unilateral, loose, with 3 to 6 flowers, rarely more. Valves of spathe very unequal. Lower lobes of perianth all equal. Seeds narrowly winged. In fields and on uncultivated ground: more frequent than the preceding. *Malta*; at Notabile, Dingli, Fakkania, Wardia, Wied Ghomor, Wied Balluta, ghain rihana etc. *Gozo*, at Xlendi and Imgiar ix-Xini.

**GLADIOLUS SEGETUM Ker-Gawl.** Bulb u.s. Spike distichous, with 3 to 13 flowers. Perianth clear violet-red, with the lower lobes spotted u.s., all more or less equal, the middle upper lobe longer, hooded and about twice as broad as the lateral.s Capsule more or less globose; seeds not winged, but with a process at the base; the rest u.s. (P) Mediterranean region, as far as Crimea, the Caucasus and Persia, Madeira, the Canaries. March-May. *Malta*, *Gozo and Comino*; very common especially in fields among growing crops.-*Gladiolus italicus* Gaux. E. Round-seeded Corn-flag. I. Fil di Spada, Pancacciuola. M. Habb il Kamh.

#### ANTHOLYZA L.

Bulb solid, with reticulated fibrous tunics. Spikes many-flowered, more or less distichous, with 2 spathes for each flower. Perianth tubular, arched, bilabiate, with the 3 lower lobes much smaller than the upper and more or less wrinkled. The rest as in *Gladiolus*. Includes about 5 species, natives of South Africa.

**ANTHOLYZA AETHIOPICA L.** Bulb large, flat. Stem up to 1 m high. Leaves linear, ensiform, distichous, up to 3 cm broad. Bracts flushed reddish. Perianth dark red, with the 3 lower lobes yellowish or greenish red, about half



the length of  
cm long. Stigmas linear, slightly flattened at the tip. (P) Native of the Cape of  
Good Hope. February April. *Malta*  
Boschetto, Verdala Park, San Antonio gardens, and in many other gardens:

Corn-

cultivated in gardens and is also naturalised in the Verdala Park, the

-*Iris chinensis* Bot. Mag. *Moraea fimbriata* Hort., a  
native of China, with branched stems 40 to 50 cm high; with bearded pale  
-shaped, t

oblong-

and azure blue, is frequently cultivated and is sometimes met with growing  
half wild in old gardens, (Musta, Sliema etc).

*ANOMATHECA CRUENTA* Lindley, native of the Cape of Good Hope, has

lanceolate, sheathing; stem erect, often branched, higher than the leaves, 20  
to 30 cm high. Flowers sessile forming a spike with bracts; tube  
narrowed at the base, limb with 6 oblong, spreading, star-  
red or vermillion-

inserted on the throat of tube, style filiform with bifid linear stigma. Capsule  
ovoid, wit -May,

other gardens in Lia, Balzan and Attard, growing in the fissures between  
stone slabs of pavements, garden-

-woody plants, with dextrorse twisting stems and with

petiolate palminerved, entire or palmisect, with reticulate nerves. Stipules  
wanting. Flo

usually herbaceous, with 6 segments, on short free filaments, with dorsifixed,  
introrse, 2 celled anthers. Ovary inferior, 3-

connate at the base: stigmas usually obtuse. Ovules anatropous, solitary or  
-celled, loculicidal;

-celled or 2 celled by obliteration of the  
septa. Seeds compressed or winged when the fruit is a capsu  
when it is a berry, with dense fleshy or cartilaginous albumen.

The family includes 8 genera, with more than 165 species, natives of tropical  
and subtropical regions, only 2 being found in Europe.

The roots or tubers of *Dioscorea* contain abun  
material, as well as an acrid and bitter principal which usually disappears by

cooking. Such is the case of *Dioscorea sativa*, *D. Batatas* and other species, cultivated for food under the name of yam. The tuber of *Tamus communis* is a purgative and diuretic.

## TAMUS L.

Flowers dioecious. Perianth divided in 6 campanulate spreading segments. Male flowers with 6 stamens inserted on the tube of the perianth; with dorsifixed anthers. Female flowers with oval inferior ovary, of 3 cells each with 2 ovules, and six rudimentary stamens; style trifid with bilobed stigmas. Berry globose, red, with 3-6 globose seeds. Includes 2 species, of which one is limited to the Canary Islands.

**TAMUS COMMUNIS L.** Rhizome long, deep, tuberous and fleshy. Stems annual, herbaceous, twining. Leaves petiolate, deeply cordate-ovate, acuminate, with rounded lateral lobes. Flowers small, greenish, in axillary racemes or spikes: male spikes many-flowered, longer than the leaves: the female few-flowered, short (P) Central Europe and the Mediterranean region. April-May. *Malta*, rare, at Gneina, Mistra and Ghain Tuffieha. *Gozo*, in the valley of Imgiar ix-Xini, where it is frequent along the sides of the valley. *E.* Black Briony, Ox-berry. *I.* Vite nera, Cerasiola, Tamaro.

## ORD. GLUMIFLORAE.

### CYPERACEAE.

Grass-like herbs, with short or creeping rhizome entirely sheathed by scales or by the base of the leaves, often stoloniferous, sometimes forming tubers at its extremity. Stem a typical calamus, angular or cylindrical, with nodes bearing leaves or scales at the base, and with similar closely-set nodes, with leaves at the apex. Leaves alternate at the nodes, equitant, in 2 or 3 rows; with a petiole within the sheath, sometimes without blade and then the petiole is long and mucronate. Sheaths very rarely cleft. Blade linear or folded. Stipule axillary, joined to the sheath, sometimes extending beyond the sheath as a cushion or ligule. Flowers hermaphrodite, or monoecious or dioecious; rarely solitary, usually in spikelets, often forming panicles or glomerules, furnished with bracts. Each floret has 1 to 2 scarious bracts or glumes. Perianth wanting, or made of 6, or 3, or many bristles. Stamens hypogynous, 3 sometimes reduced to 2 or 1, rarely 4 or more, free, with filiform or flattened filaments, with 2-celled, linear, basifixed, introrse anthers. Ovary free, sessile or stipitate, usually trigonous, sometimes compressed, one-celled, one-ovuled. Styles 3 rarely 2, more or less coherent at the base. Ovule anatropous. Fruit a caryopsis, often trigonous, usually with the persistent base of the style adhering to it; very rarely a drupe. Seed albuminous, with starchy or sometimes fleshy albumen, very commonly with the minute embryo exerted.

The family includes 61 genera, with about 2300 species, broadly distributed in humid or marshy places all over the world.

The rhizome of *Cyperus longus* is aromatic and bitterish, and has diuretic and tonic properties. The tubers of *C. esculentus* are sweet and edible. *Scirpus lacuster* is astringent and diuretic; its stems form excellent material for filling mattresses. *Cyperus Papyrus* is the source of the famous Egyptian papyrus, which was prepared by slicing the pith of the culm into a roll, which was then pressed and hammered and smoothed down, so as to form a sheet of various length. On the other hand, the Cyperaceae have little nourishing value, and afford only poor pasturage.

#### TRIBE I-CYPEREAE.

Flowers hermaphrodite. Spikelets many-flowered, compressed. Glumes distichous and equitant, all floriferous, rarely with the lowest one or two sterile. Perigonium wanting or reduced to scales.

#### CYPERUS (Tourn.) L.

Spikelets in umbel-like inflorescence or in heads, furnished with an involucre of unequal bracts. Glumes often keeled, the lowermost sometimes sterile. Stamens 2 or 3, rarely reduced to one. Style filiform, with 2 or 3 glabrous stigmas. Achene or caryopsis trigonous or compressed. Includes about 400 species, natives of tropical and subtropical regions, a few being found in temperate regions.

**CYPERUS LEVIGATUS L.** Stems rush-like, with only one leaf; with 2 involucral bracts, of which the lower is very long, in continuation with the stem, and the other very small and scale-like. Spikelets oval or oval-lanceolate, 5 to 9 mm long, with dark or whitish glumes. Achene obovate-obtuse, slightly compressed. Stems not more than 2 diameter long. (P) In tropical, subtropical, and sometimes in temperate regions, all over the world. Spring to autumn.-*Cyperus mucronatus* Rottb.-*C. cossyrensis* Tin. The typical form does not exist in the Maltese Islands.

Var. *distachyus* All.-*Cyperus junciformis* Cav. Stems stronger, up to 3 diameter long. Spikelets linear-lanceolate, 8-15 mm long; glumes dark reddish. Achenes elliptical, acute. In moist valleys and gardens. *Malta*, rather rare, at Saline, Ghain Mula, Ghain Rihana, Wied Bufula, Marsascala, Marsa, Wied Hanzir, near Addolorata Cemetery etc. *Gozo*, also rare, at Ramla, xlendi, Imgiar ix-Xini, Dueira.

**CYPERUS FUSCUS L.** Stems many, aggregate, bushy, 1 to 4 diameter long, with fibrous roots. Leaves linear, flat. Bracts 3 to 5, leaf-like, very long. Spikelets numerous, in heads or glomerules, 3-5 mm long. Glumes twice as long as the achenes, compressed-keeled, with a green keel, and for the remainder dark or black; very rarely entirely pale yellow. Scales or lodicules of perigonium wanting or indistinct. Achene compressed, with the margin

directed towards the rachis of the spikelets. (A) Central Europe, Mediterranean region, Madeira, August-November. *Malta*, rare, at Wied Hanzir near Marsa. The form: *virescens* Hoffman, with the glumes entirely pale green has been found at Imtahleb.

**CYPERUS ESCULENTUS L.** Rhizome stoloniferous with tuberous formations at the end of the roots. Stems trigonous, 3 to 5 diameter long, about as long as the leaves. Tubers oblong, thick. Involucral bracts about 5, one or two of which being longer than the umbel. Plant flowers rarely. Spikelets dirty yellow, about 1 cm long, glumes with many nerves, loosely equitant. (P) Mediterranean region as far as the Caucasus; tropical Africa, Madeira and Cape Verde Islands. June-October. *Malta*; occasionally cultivated, rather as a curiosity, and then becoming partly naturalised in gardens. E. Edible Rush-nut, "Chufa". I. Babbagiggi, Dolcichini. M. Habb ghaziz.

Var. *aureus* Ten.-*Cyperus melanorrhizus* Del. Tubers small, almost globose, more or less dark coloured, with circular rings only visible when young. *Malta* and *Gozo*; here and there in moist fields and gardens.

**CYPERUS LONGUS L.** Rhizome long, creeping, more or less thick, without tubers. Stems trigonous, thick, 8-12 diameter long. Leaves very long, linear, keeled, scabrous with small teeth along the margin. Involucre made of about 4 linear bracts, all longer than the inflorescence. Spikelets linear-acute of varying length, reddish, dark reddish or yellowish, on rays more or less ramified, the lateral rays of the umbel being much longer than the spikelet between them. (P) Central Europe, the Mediterranean region, tropical Africa, Canaries, Argentina, the Mascarene Islands. April-September. *Malta*, frequent here and there, in moist valleys, as at Wied Encita, Boschetto, Ghirghenti, Imtahleb, Gneina, Bahria, Fiddien, Melleha etc. *Gozo*, Xlendi, Wied Lunziata, Wied Bingemma, Ghainsielem, Migiarro, San Blas, Ramla. E. Galingale, Cypress-root. M. Bordi.

Var. *badius* Desf.-*Cyperus neglectus* Parl. Stems more slender, 3-6 diameter long, often less. Rays of umbel simple or mostly simple; when slightly ramified the secondary rays are never longer than the spikelet between them. The rhizome is much more slender, without the peppery odour of the typical form. Mediterranean region. Along streamlets, on irrigated ground, and in moist fields and gardens; frequent in *Malta* and *Gozo*. E. Galingale. M. Bordi or Soghda.

**CYPERUS PAPYRUS L.** Rhizome thick, slowly creeping, almost caespitose. Stems 1 to 3 m high, round below, obtusely trigonous above, with sheaths at the base, reddish and leafless, or prolonged into a broad short lanceolate blade. Involucral bracts many, lanceolate, shorter than the inflorescence. Umbel large, compound, made of many small umbels on long rays, each with an involucel of 3 very long bracts. Spikelets small, reddish. (P) Originally native of Syria, Palestine and tropical Africa, naturalised in Sicily. Was formerly found naturalised at Gneina, whence the plants now grown in public gardens etc. were originally transplanted.-*Cyperus syriacus* Parl. E. Egyptian Papyrus. I. Papiro. M. Papiro or Papiros.

Stems cylindrical 5 to 50 cm long. Leaves recurved, glaucous-keeled. Involucre made of about 6 bracts, of which the outer are very long, leaf like, and the inner are short and scale like. Inflorescence contracted, sessile and globose like a head. Spikelets large, oval lanceolate; glumes reddish brown with lighter margin, with a keel often green, the outer or lower larger than the next ones. (P) M -June.

, in sandy places along the sea-

Gneina. Gozo -Schoenus mucronatus L. Cyperus capitatus Vand.-  
-Galilea mucronata Parl.

## CYPERUS ALTERNIFOLIOIDES

ornament, and is sometimes met with naturalised in gardens.

## TRIBE II-

flowers. Glumes imbricate all round, all floriferous, except the lowermost one

more bracts. Glumes not mucronate, the lowermost one or two often sterile.

Stamens 3, with persistent filaments. Style not thickened at the base, with 2 or 3, rarely 4 stigmas. Achene plano convex or triangular, mucronate at the apex. This tribe includes about 200 species, dispersed all over the world, as far as the Polar regions.

SCIRPUS MARITIMUS L. Rhizome with tuber like round swellings, creeping. Stems trigonous, 5 to 12 diameter high. Leaves flat, keeled. Anthela with one or more peduncled glomerules, with leafy involucral bracts. Spikelets thick, oblong or oval, reddish brown, 1 to 1½cm long; glumes bifid at the apex, mucronate between the lobes. Perigonal bristles present. -June. Along streamlets.

, rare, at Marsa, Ghain Mula, Gneina. Gozo  
Blas, E. Sea-rush, Spurt grass. I. Mosca, Erba nocca.

SCIRPUS HOLOSCHOENUS L. Rhizome creeping, caespitose. Stems rush-like -20 diameter long, with cylindrical, grooved. Anthela with one very long bract, in continuation with the

compact, each with several spikelets. Glumes obovate emarginate, retuse, dark green, with scarious laciniated margin. Perigonal bristles absent. (P)

Central Asia, the Canaries. April- -Holoschoenus. vulgaris Link. E.  
Clustered C -Rush.

Var. *Linnaei* Asch. et Gr.-*Holoschoenus Linnaei* Rehb. Anthela almost simple, rather small and dense, not longer than the involucre bract. *Malta*, rare, at Boschetto and Wied Dalam.

Var. *globiferus* L. f.-*Holoschoenus globifer* Dietr. Anthela large, compound, longer than the involucre bract. *Malta*, frequent and often common, Boschetto, Ghirghenti, St Paul's Bay, Melleha, Mistra, Imtahleb, Fiddien, Kleigha, Gneina, Ghain Tuffieha, Bahria etc. *Gozo*, Wied il Ghasri, Xlendi, Migiarro, Kala Dueira.

**SCIRPUS LACUSTER** L. Rhizome thick, creeping. Stems cylindrical, rush-like, with 2 or 3 sheaths at the base, of which the upper is prolonged as a short blade, more or less deep green,  $\frac{1}{2}$  to 2 m high. Anthela usually expanded, with unequal rays; rarely contracted and head-like. Spikelets oval-oblong, reddish brown. Glumes emarginate, and mucronate at the apex, smooth or slightly scabrous, lacinate along the margin. Perigonal bristles scabrous or toothed on the outer side. Stigmas 3. Achene opaque, trigonous, up to 3 mm long. (P) Cosmopolitan. April-June. In ditches and ponds and along pools in valleys. *Malta*, rare or very rare, at Marsa, Wied Hanzir, Ghain Mula and Wied ta Ghajn Rihana. E. Bass, Common Bul-Rush. I. Giunco di palude.

Var. *Tabernaemontani* Gmel.-*Scirpus glaucus* Sm. Stems more or less glaucous, not more than 1½ m high. Glumes very scabrous. Achene not more than 2 mm long, shining, plano-convex. *Malta*, at Ghain Mula, Wied Hzeijen and Wied ta Ghajn Rihana.

**SCIRPUS SETACEUS** L. Rhizome caespitose; stems filiform, 3 to 15 cm high, striated, rarely prolonged more than 5 mm beyond the inflorescence. Sheaths furnished with setaceous blades. Spikelets limited to 1 to 3 about 3 mm long, ovate, blackish or sometimes greenish. Glumes ovate, concave, obtuse or slightly mucronate. Stigmas 2 or 3. Achenes with longitudinal, or sometimes also transverse, lines. (A) or (B) In temperate and warm regions. Spring and summer.-*Isolepis setacea* R. Br. The typical form does not exist in the Maltese Islands.

Var. *filiformis* Savi.-*Scirpus cernuus* Vahl.-S. Savi Seb. et Maur.-*Isolepis sicala* Presl.-I. Saviana Schult. Stems 3 to 30 cm high. Achenes almost smooth, or furnished with tubercles in longitudinal series. *Malta*, here and there, along streamlets or ponds, or in moist valleys, as at Imtahleb, Wied ta Ghajn Rihana, ghain Mula, Fiddien, Wied Gherzuma, Bahria etc.

#### HELEOCHARIS R. Br.

Spikelets solitary, terminal. Glume floriferous, except the lowermost one or two. Style thickened at the base, jointed to the ovary. Perigonal bristles 4 to 6, scabrous. Sheaths aphyllous. Includes about 80 species, distributed all over the world.

HELEOCHARIS PALUSTRIS R. et S. Rhizome long, creeping. Stems thick, erect, caespitose or in clusters, 20 to 60 cm high, but rarely more than 20 cm if not immersed in water. Basal sheaths leafless. Glumes ovate-oblong, reddish-brown, or rusty colour, usually with the lower two sterile, acute or obtuse, forming oblong, acute spikelets 10-20 mm long. Style thickened at the base; the swelling being oval-depressed. Perigonial bristles 4 to 6. Achenes yellowish-brown to blackish. (P) In most countries outside the tropics. March-june. Along streamlets in ponds and in valleys. *Malta*, frequent, at Imtahleb, Fiddien, Boschetto, Wied Gherzuma, Wied Hzeijen, Ghain Mula, Ghain Rihana, etc. *Gozo*, Migiarro, Dahlet Korrot.-*Scirpus palustris* L.-*Eleocharis palustris* Zeraph et Auct.

Var. *nebrodensis* Parl.-*Scirpus palustris* b. *minor* Guss.-s. *nebrodensis* Ach. et Gr. Plant more slender and shorter. Sterile stems recurved. Spikelets ovate, short, obtuse. With the typical form at Boschetto, Ghajn Mula etc.

### TRIBE III-RHYNCHOSPOREAE.

Flowers hermaphrodite, rarely unisexual by abortion. Spikelets with only the upper 1 to 3 florets fertile. Glumes mostly imbricate all round, except in *Schoenus*, the lower 2 or more glumes being sterile. Perigonium made of bristles, rarely wanting altogether.

### SCHOENUS L.

Spikelets in a terminal head, compressed at the sides, with one to three hermaphrodite florets with subulate bracts, scarious and rusty coloured, one or two prolonged in a leafy process. Glumes lanceolate, keeled, almost distichous, the lower sterile one being smaller. Perigonial bristles 6 or almost wanting. Stamens 3; style filiform with 3 stigmas. Achene white, globose-trigonus. Includes about 60 species, mostly natives of Australia, about 7 being distributed all over the world.

SCHOENUS NIGRICANS L. Stems rush-like, cylindrical, 2 to 4 diameter high, densely caespitose, with black shining sheaths at the base, the outermost marcescent, the inner prolonged into a rigid blade, filiform, keeled, shorter than the stem. The larger bract of the involucre longer than the inflorescence which is head-like, with 5 to 10 blackish spikelets with subulate rusty scarious bracts u.s Perigonial bristles almost wanting. (P) Europe, Africa, Western Asia, North America. April-June. *Malta*, Gneina, Wied il Ghasfurja Bahria. E. Borg-Rush. I. Giunco nero.

### CAREX L.

Spikelets of monoecious flowers, very rarely dioecious, solitary, in spike, head or panicle. Usually the upper spikelets being male and the lower female, or in the same spikelet the upper flowers being male and the lower female or viceversa. Stamens 3. Ovary enclosed in a utricle made of a secondary glume, persistent in the fruit. Style with 2 or 3 stigmas, protruding from the apical aperture of the utricle. Achene compressed or trigonus. Includes

over 500 species broadly dispersed in cold and temperate regions, a few being found in mountainous tropical regions.

CAREX DIVISA Huds. Rhizome creeping, long. Stems 2 to 5 diameter high; leaves linear, flat, grooved at the base. Spikelets all bisexual or androgynous in the same spike, which is ovate or oblong, lobulate. Lower bract with a rather long leafy process. Utricle oval, not winged at the sides, plano-convex, with a short bifid beak. Stamens indistinctly mucronate. Stigmas 2. (P) Temperate regions of the northern hemisphere and South Africa. February-May. *Malta*, *Gozo* and *Comino*. Common along streamlets and in moist weedy places.-*Carex cuspidata* Bert. e. Marsh-Sedge. M. Soghda.

Var. *chaetophylla* Steud.-*Carex setifolia* Godr. non Kunze. Leaves reflexed, grooved along their whole length. Plant smaller. Utricle elliptical with the typical form, in more dry localities.

CAREX VULPINA L. Stems thick, 3 to 6 diameter high, with concave surfaces, scabrous in their upper portion. Leaves flat or grooved, 5 to 9 mm broad. Spike compound, dense, often interrupted. Beak of utricle denticulate at the margin, with 6 to 7 nerves at the back. Stigmas 2. Achenes trigonous. (P) Europe, the Mediterranean region, North Asia, South Africa, the Canaries. April-June. Along streamlets and in moist places. Frequent in *Malta* and *Gozo*. The form: *n longibracteata* Beck, with narrower spike and with bracts longer than the spikelets and furnished with a setaceous process at the apex, has been collected at Ta Baldu. E. Great-spiked Sedge. M. Soghda.

CAREX MURICATA L. Stems slender, trigonous with flat sides, somewhat scabrous, 2 to 6 diameter long. Leaves flat, 2 to 4 mm long, often weak and curved. Spike slender, almost simple, more or less oblong or elongated, more or less interrupted at the base. Utricle with beak toothed-scabrous at the margin, with indistinct nerves. Stigmas 2. Achenes compressed, lenticular. (P) In temperate and mountainous tropical regions. April-June. The typical form is unknown in the Maltese Islands. E. Prickly Sedge.

Var. *divulsa* Stokes. Stems weak and hanging. Spike more elongated, and interrupted at the base. Utricles more erect, smaller, and less scabrous as the sides of the beak. *Malta*, here and there, at Boschetto, gGirghenti, Ghain il Cbira, Wied Encita, Gneina, Fiddien, Wied Ghomor etc. *Gozo*, Imgiar ix-Xini.

CAREX HALLERIANA Asso. Plant bushy, with short rhizome. Stems 1 to 2 diameter long, rarely more. Leaves narrow, linear. Inflorescence usually with one or two female spikelets on long peduncles at the base of the stem. Upper inflorescence with 1 to 4 spikelets, globose or elliptical, the upper sessile. Utricle oblong-obovate, trigonous, 4 to 5 mm long, with many nerves, stipitate, minutely hairy. Achene without a disk-like ring at the apex. (P) Mediterranean region, India. Among shrubs in shaded and moist localities. *Malta*, rather rare, at Wied Babu, Wied iz-Zurriek, Ta Gandia, Wied Hanzir.-*Carex alpestris* All.- *C. gynobasis* Vill.-*C. ambigua* Kuk. The form:



Sommieriana mihi, found at Wied Babu and Ta Gandia, differs from the by the uppermost male spikelet which is longer and more slender, and by the next spikelet which is androgynous, that is the lower florets female and the

toloniferous, plant  
2 to 4 diameter high. Leaves glaucous, stiff, more or less keeled. Spike with  
-subcylindrical,

sheaths. Glumes lanceolate mucronate or cuspidate, entire at the margin,  
-compressed, more or less scabrous,

beak. Female spikelets becoming pendulous when in fruit. (P) Europe, the

Zealand and North America. March- -Carex flacca Schreb. C. glauca  
Scop. C. recurva Huds.- o  
exist in the Maltese Islands.

Var. cuspidata Host. Carex serrulata Biv.-

Female spikelets usually erect, even when in fruit. Glumes of female flower  
more mucronate or cuspidate. Leaves more distinctly serrulate. Common  
valleys and moist places in *Malta* *Gozo*.

CAREX HISPIDA W. Plant u.s. but much more robust, with rhizome more  
acutely keeled, with reticulate fibrous sheaths. Inflorescence large; female

the female florets linear-  
ciliated or denticulate along the margin. Male spikelets 3 to 6. Utricle  
obovate, pl -convex, ciliated hispid, furnished with a short beak. (P)  
Mediterranean region; naturalised in Chili. April May. *Malta*  
Imtahleb.-

high. Leaves flat, 2 to 5 mm broad. Female spikelets 3 to 4, erect, oval  
oblong, in loose inflorescence, the lower ones having a long peduncle. Lower  
bract sheathing; all bracts erect, none of them longer than the stem. Male  
one. Utricle oval, swollen, shining, without  
distinct nerves, dotted, with a rather short bifid beak smooth at the margins.  
-May. ,

rare, at Gneina, according to Delicata. Carex pallidior Degl. Carex corsicana  
Link.

CAREX DISTANS L. Plant u.s. Female spikelets far apart on the same  
stem, which is 2 to 7 diameter high. Spikelets commonly not more than 2 cm  
long -oblong, mostly erect, and with

mucronate. Utricle oval, not dotted, with strongly marked nerves, with a bifid  
beak, denticulate on the inner ma

(P) Europe, the Mediterranean region, Canaries, Madeira; naturalised in North America. April-May. In valleys and moist localities. *Malta*, frequent here and there, as at Imtahleb, St Paul's Bay, Melleha, Ahrax, Mistra, Ta Baldu, Wied Encita, Boschetto. Gozo, Ramla, Wied ir-rihan, Migiarro. E. Loose Sedge.

CAREX EXTENSA Good. Plant bushy, 2 to 4 diameter high. Leaves and bracts convolute and grooved, almost rush-like, the bracts being longer than the stem, becoming spreading or reflexed. Female spikelets 2 or 3, subsessile, ovate or oblong, the upper ones closely set together, Male spikelets usually reduced to one. Bract furnished with short sheath. Utricle oval, dotted, with distinct nerves, furnished with a short bifid smooth beak. (P) Europe, the Mediterranean region, South Africa, Madeira; naturalised in North America. April-May. *Malta*, must be very rare; according to Parlatores; locality not stated.-*Carex nervosa* Desf.

## GRAMINACEAE.

Plants annual or perennial, mostly herbaceous and caespitose, rarely frutescent or arborescent, with fibrous roots or with creeping or stoloniferous rhizome. The stem is a culm, usually simple, cylindrical and fistular, but sometimes solid or pithy, with nodes at the insertion of the leaves. Leaves alternate, distichous, with a dilated petiole forming a sheath on the stem: blade entire, usually very long and linear, lanceolate, with parallel nerves, with a stipule shaped like a ligule at the base of the blade and applied to the stem. The inflorescence consists of spikelets sessile or peduncled, variously disposed in compound spikes or in panicles. The spikelet consists essentially of two lower bracts called glumes, with a varying number of florets, hermaphrodite or sometimes monoecious, each having a lower bract or lower palea often prolonged into an awn, and an upper bract or upper palea which is always awnless. The perigonium is reduced to two scales or lodicules. Stamens normally 3, each having a very slender filiform filament and a long dorsifixed anther. Ovary superior, with 2 rarely 3 stigmas, branched or plumose, inserted separately on the ovary or on a short style. The fruit is a typical caryopsis, with coriaceous pericarp adnate to the involucre of the seed, with abundant albumen.

This large family includes 295 genera, with about 3320 species, distributed all over the world.

From an economical point of view the Gramineae or Grasses are the most important of all vegetables. They furnish the staple food of men and animals in all countries. In this respect it is sufficient to mention wheat, rice, maize, barley, rye and oats. Sorghum, the durrah or dari-seed, is largely cultivated throughout Africa and in other countries, as food for men and animals. These are the so-called cereals rich in nourishing material, viz: starch and gluten or aleurone. The pastures on which the herds of cattle and sheep are fed, and which also furnish feeding material to many other herbivorous animals, wild or domesticated, consist of grasses. The seeds of *Phalaris arundinacea* (Canary-seed), of *Panicum miliaceum* (millet), of *Setaria italica* (Italian millet) etc. are greedily eaten by birds. Cane-sugar is the produce of the stems of

Saccharum officinarum. Sugar is also obtained from the stems of Sorghum baskets etc. Bamboos are largely used in the Far East for a variety of purposes, including hut building and paper-Donax are used in decoction as an emollient and diuretic; the same property -grass (Cynodon Dactylon), and by the stigmas of and have narcotic and paralyzing qualities.

#### TRIBE I MAYDEAE.

Plant monoecious, with male spikelets forming an upper terminal panicle, and female spikelets forming lower lateral spikes enveloped more or less in

-flowered sp

emarginate glumes and 4 paleae, 2 for each floret. Female inflorescence in one or few lateral axillary spikes, considerably below the terminal male and formed of two-spikelets being disposed in many rows on a fleshy or thick axis, each having 2 glumes and 4 fleshy paleae, 2 for each floret. Styles filiform, 15 to 20 cm udes only one species.

ZEA MAYS L. Stem or stems erect, strong, 5 to 20 diameter long. Leaves broadly linear lanceolate, scabrous along the margin, with short ciliated ligule. Caryopsis yellow or white, rarely red or brownish. (A) Native probably of entral and South america; broadly and extensively cultivated in many countries. June August. *Malta* *Gozo*, cultivated for its grain as a cereal, plant, flowering and maturing earlier, producing grain of various forms is also strong as in the typical form, but the grain on drying become more or less wrinkled and semi transparent, and is consumed as vegetable in a green -rum.

#### COIX L.

Plant caespitose, with several male and female inflorescences on the same -flowered spikelet each with 2 glumes and 4 paleae. Female inflorescence made of a fertile spikelet with two lateral sterile spikelets, enclosed in a whitish or greyish bract stigmas and the rachis of the male inflorescence. The fertile female spikelet -flowered, with 2 glumes, and 2 fertile paleae and 2 sterile paleae. the East Indies and Ethiopia, one being broadly dispersed in warm regions.

COIX LACRYMA-JOBI L. Stems branched, 3 to 6 diameter high. Leaves linear, rather broad. Male and female inflorescences on same stem, borne on clusters of axillary branches. Involucral bract enclosing the female inflorescence, round, smooth and shining, whitish, greyish or purplish, of a stony consistence. (A) or (P) Native of the East Indies and Nubia. June-October. Cultivated for ornament and for the sake of the round stony bracts which are sometimes made into beads; met with here and there naturalised in gardens and on irrigated ground, in *Malta*, *Gozo* and also in *comino*-Coix Lacryma L. E. Job's tears I. Lacrima di Giobbe. M. Zibeg tal curuni, Dmuh ta Giobb, Hara tac-Ciaul.

## TRIBE II-LYGEAE.

Spike made of 2, rarely 3, hermaphrodite spikelets, adnate at the base, villose on the outside, enclosed in a common bract which replaces the glumes. Paleae paper-like, with silky hairs, the upper longer than the lower and enveloping the stamens and pistil. Style very long, filiform, entire.

## LYGEUM L.

Same characters u.s. Includes only one species.

LYGEUM SPARTUM L. Rhizome creeping. Stems caespitose, simple, solid, stiff, 2 to 4 diameter long. Leaves rigid, convolute, with a very long ligule. (P) Spain, Southern Italy, Sicily, Crete, Zante, North Africa. February-June. Common on stony and clayey hill-sides, especially not far from the sea. *Malta*, Imtahleb, Gneina, Ghain Tuffieha, Saline, Fauuara, Fomm ir-rieh etc. *Gozo*, Wied il Ghasri, Nadur. Migiarro, Xlendi. E. Cord-grass, Esparto-grass. I. Sparto. M. Halfa, Spartu.

## TRIBE III-ANDROPOGONEAE.

Spikelets in clusters of 2 or 3 along the jointed rachis of the spike or on the branches of the panicle: one being hermaphrodite, rarely female, and sessile; the others male, rarely neutral, peduncled; or all hermaphrodite, sessile or peduncled. Hermaphrodite and male spikelets one-flowered, with a lower sterile palea. Glumes often coriaceous, enveloping the flowers. Lower palea membranous, often furnished with awn; upper palea sometimes very small or wanting.

## ANDROPOGON L.

Spikes linear, racemose, with a jointed hairy rachis. Spikelets in pairs or triplets; one sessile, the other peduncled. Male spikelets peduncled, with the lower palea awnless. Glumes, in both male and female spikelets, awnless or awned. Hermaphrodite spikelets sessile, with the lower palea almost wanting and transformed into an awn set at an angle, upper palea very small. Includes about 170 species, natives mostly of warm regions, a few being found in South Europe, North America and temperate Asia.

ANDROPOGON HIRTUS L. Plant strong, caespitose, 4 to 12 diameter, with glaucous leaves; the floral leaves spathaceous, and turning reddish, hairy as all other parts, with spreading hairs. Hermaphrodite spikelet sessile, with the awn set at an angle, 4 times as long as the florets. Male spikelets peduncled, with hairy peduncles, very rarely glabrous, awnless. Glumes both membranous and hairy. (P) Mediterranean region, the Canaries, Madeira, Azores, Hayti. March-November. *Malta* and *Gozo*; common on rocky and in valleys; frequent also in *Comino*.

Var. pubescens Vis.-Andropogon giganteus Ten. Plant more slender, slightly hairy, with applied hairs. Awn 5 to 6 times as long as the hermaphrodite flower. *Malta*, *Gozo* and *Comino*, with the typical form, but less frequent.

ANDROPOGON DISTACHYUS L. Plant caespitose, 3 to 6 diameter high, strong and stiff. Leaves linear, green, with few hairs. Spikes in pairs, very rarely in triplets, at the apex of the stems, one sessile, the other peduncled with peduncles and rachis hairy. Spikelets glabrous or pubescent. Lower glume herbaceous-membranous; the upper glume of the hermaphrodite spikelets and the lower of the male, bifid and awned, hence the hermaphrodite spikelet has 2 awns, and the male only one. (P) Mediterranean region, West Africa, Canaries, Abyssinia, Arabia. March-October. In dry localities, on rocky land and in valleys. *Malta*, frequent, at Wied Encita, Boschetto, St Paul's Bay, Wardia, Wied Babu, Wied Kirda, etc. *Gozo*, less frequent, at Ta Cenc. Sannat and Xlendi.-Pollinia distachya Spr.

#### SORGHUM Moench.

Inflorescence in panicle. Spikelets geminate along the branches, and in triplets at the end of same, hairy at the base and on the back; one hermaphrodite and sessile, the others male or neutral and peduncled. Male spikelets with 2 membranous glumes; paleae 2, awnless. Hermaphrodite spikelets one-flowered, with coriaceous glumes; lower palea awnless, or bifid and awned, with jointed and tortuous awn, the upper palea very small. Includes 2 species, natives of warm and temperate regions.

SORGHUM HALEPENSE (L) Pers. Plant perennial with long creeping rhizome. Stems erect, 4 to 15 diameter long. Leaves linear-lanceolate. Panicle erect, pyramidal, with racemes having a jointed rachis. The peduncled male, rarely neutral, spikelets are subequal to the hermaphrodite sessile spikelets, with their peduncle about half as long. Hermaphrodite spikelets mostly awned, and pubescent. (P) south Europe, Africa, Atlantic Islands, Western Asia, India, China; naturalised in America and Australia. May-October. *Malta*, frequent here and there but not common; at Boschetto, Imtahleb, Gneina, San Martin, Melleha, etc.-Holcus halepensis L.-Andropogon Sorghum Brot. Subsp. Halepense Hack. The hermaphrodite spikelets are awnless in the form: muticum Hack, and glabrous in the form: leiostachyum Hack. E. Aleppo Millet-grass. I. Cannarecchia, Dente cavallino.

SORGHUM VULGARE Pers. Plant annual, caespitose, with fibrous roots. Stems stiff, erect, strong. Leaves u.s., very broad, sometimes with a white

median nerve or keel. Panicle erect and dense, with racemes having an indistinctly jointed rachis. The peduncled neutral, rarely male, spikelets often shorter than the sessile hermaphrodite spikelets, and their peduncle is 4 to 5 times shorter. Hermaphrodite flowers awned or awnless. Glumes as long as the caryopsis, which is white, brown or reddish. (A) Native of tropical Africa: extensively cultivated in warm and temperate regions. June-October. *Malta* and *Gozo*, cultivated mostly as green fodder: the seeds are fed to poultry.-*Holcus Sorghum* L.-*Andropogon Sorghum* Brot. Subsp. *Sativum* Hack. E. Durrah, dari-seed. I. *Saggina*, *Melica*. M. *Karabocc*.

Var. *saccharatum* Moench. Central axis of panicle elongated, panicle more or less obovate. Spikelets yellowish-red or reddish-brown. Occasionally cultivated as green fodder.-*Holcus saccharatum* L. This plant is occasionally grown in certain countries for the extraction of sugar. E. Broom-grass, Sugar-Millet. I. *Saggina* da scope.

Var. *cernuum* Host. W. Stems curved down below the panicle, which is therefore drooping. Caryopsis white, thick, longer than the glumes.-*Andropogon Sorghum* Brot. Var. *Durra* Hack. Occasionally cultivated for fodder and for its seed. The durra replaces wheat for bread-making in certain parts of Tropical Africa. E. Texas Millet.

#### TRIBE IV-PANICEAE.

Spikelets all hermaphrodite, solitary or in pairs or in two series on an unjointed rachis, but jointed below the glumes, having one superior hermaphrodite floret and one lower neutral or male. Glumes 2, membraneous, mostly unequal, the lower sometimes very small or wanting. Hermaphrodite flower with 2 paleae, awnless, coriaceous when in fruit. Neutral or male flowers with 1 or 2 paleae, the lower one being awned in species of *Panicum*.

#### PENNISETUM Rich.

Inflorescence a spike. Spikelets mostly geminate, sessile, with an involucre of bristles, sometimes bearded, falling off with the spikelets. Spikelets made of an upper hermaphrodite floret and a lower male or neutral floret. Glumes 2, shorter than the florets; each floret with 2 paleae. Includes about 40 species, mostly natives of Africa.

PENNISETUM VILLOSUM R. Br. Stems caespitose, erect or ascending, 1 to 3 diameter long. Leaves long, linear, glabrous, but ciliated close to the sheath. Spike mostly surrounded at the base by the upper-most sheath; bristles unequal, twice or thrice as long as the spikelets, setaceous, silvery-white. Spikelets elongated; outer glume shorter than the inner. Lower palea of hermaphrodite floret 9-nerved, that of the male 5-nerved. (P) Native of Abyssinia. April-October. *Malta*, introduced in the Botanic Garden towards 1908; now found naturalised here and there on the Floriana Glacis.-P. *Longistylum* Auct. non Hochst.

PENNISETUM RUPPELLII Steudel, native of Abyssinia, occasionally  
-Seuda, .

### SETARIA P.B.

Panicle spike- ers or almost in whorls, surrounded by  
simple persistent bristles, having one hermaphrodite floret above and one

Hermaphrodite floret with 2 paleae. Includes about 10 species, natives of  
w

linear- -  
like, dense, continuous, 2 to 7 cm long on a pubescent axis, with several  
bristles for each floret, much longer than the spikelets, pale yellow  
or yellow, with fine teeth directed upwards. Glumes subequal, half as long as

rugose transversely. (A) Almost cosmopolitan. June September. *Malta*  
rather rare, in orange-  
probably elsewhere.- -grass. I. Panicastrella,

ng, often curved at an angle  
on a joint near the base, 2 to 10 diameter high. Leaves linear acuminate,  
green or slightly glaucous, 1 to 2 cm broad, scabrous. Panicle spike like,  
more or less large, lobed, up to 15 cm long, mostly pendulous, on a hirsute  
tomentose axis. Bristles 2 or few for each floret, often reddish, twice or thrice  
as long as the hermaphrodite florets, with small teeth u.s. (A) Native of the  
-

October. *Panicum italicum* L. The typical form was collected once at Imtahleb  
*Malta*) but was not found again. It is nowhere cultivated in the Maltese

y  
exceeding 1 cm in breadth. Panicle rarely more than 5 cm long, continuous,

the spikelets, pale or yellow, with fine teeth directed upwards (A) Almost  
cosmopolitan. May October. Frequent and often common in orange groves,  
*Malta*, Balzan, Lia,

Tuffieha, Melleha etc.- -grass  
Pesarone. M. Xrika.

Var. *verticillata* P.B. Stems u.s. Leaves 6 to 15 mm broad. Panicle u.s.,  
interrupted at the base, and less dense. Bristles u.s. with small teeth directed  
ily to the fur of

animals and to clothes. (A) Cosmopolitan. May October.-  
*verticillatum* L.- *Malta*, Gozo and  
very common in groves, gardens and on irrigated ground; often a troublesome  
weed. I. Panicastrella

## PANICUM L.

Inflorescence in panicles or racemes made of spikes. Spikelets with one upper hermaphrodite floret and one lower male or neutral floret, without an involucre of bristles. Glumes 2, the lower smaller and awnless, the upper rarely mucronate-awned. Hermaphrodite florets with 2 awnless subcoriaceous paleae. Neutral floret with the lower palea awnless or rarely awned, the upper much smaller or wanting. Includes about 240 species, mostly natives of warm regions, a few being found in temperate regions of the northern hemisphere, one or two being almost cosmopolitan.

**PANICUM REPENS L.** Rhizome creeping and stoloniferous. Stems slightly compressed, scaly at the base, 2 to 5 diameter high, leafy almost up to the panicle. Leaves linear, convolute, somewhat hairy. Panicle long, with erect branches solitary or in clusters of 2 or 3, rather loose and irregular. Spikelets glabrous, in pairs along the branches. (P) Mediterranean region, East and South Africa, Australia. June-November. *Malta*, frequent here and there, at Melleha, Gnien Ingrau, Marfa, Boschetto, Fiddien, Imtahleb, Gnien il Cbir, San Martin, Wardia, Puales, Gneina, Bahria etc., always in moist localities. Gozo, at Migiarro, Zenka, Ghainsielem, Wied Kasab, San Blas, Wied il Lunziata.

**PANICUM CRUS-GALLI L.** Plant annual, caespitose. Stems diffuse or ascending, often with a knee-like bend on a joint near the base, 2 to 10 diameter high, more or less cylindrical. Leaves glabrous, linear-acuminate, only slightly keeled. Inflorescence made of spikes forming a more or less branched panicle, without hairs at the nodes. Axis of spikes ciliated. Glumes and paleae ciliated on the nerves; upper glume awnless or slightly mucronate-awned. (A) Cosmopolitan. June-October. *Malta*, rare, at Imtahleb, Boschetto and Bahria. Gozo, San Blas.-*Echinochloa Crus-Galli* R. et S. E. Panich-grass, Cock's-shin grass. I. *Panica-strella*. M. Xrika.

Var. *colonum* L. Plant more slender, with smaller spikelets. Axis of spikes toothed and scabrous. Spikes in simple raceme, always perfectly awnless. *Malta*, here and there, but rather rare; at Ghirghenti, Imtahleb, Gneina, Bahria, Boschetto, Gnien il Cbir, San Martin, Puales, Melleha, Gnien Ingrau, Mistra, Selmun; always, as in the case with the typical form, along streamlets or on irrigated ground. E. Millet-Rice.

**PANICUM PLICATUM Lamk.** Plant perennial, caespitose, forming large clumps, hirsute with stiff spreading hairs. Stems erect, stiff, up to 10 diameter high. Leaves deep green, linear-lanceolate, 2 to 4 diameter long, and 2 to 3 cm broad, beautifully folded in many folds along their whole length. Panicle large, loose. (P) Mascarene Islands. April-October. *Malta*, cultivated for ornament; naturalised at San Antonio, Maglio Gardens, Boschetto, as well as in many gardens at Lia, Balzan, Birchircara, etc. M. Imbecilla.

## TRIBE V-PHALARIDEAE.



Spikelets solitary, alternate, compressed at the sides, jointed above the glumes, all hermaphrodite, each with one hermaphrodite floret above, and 2 lower male or neutral or rudimentary florets. Glumes 2, subequal, and generally entirely covering the florets. Palea hardened when in fruit.

#### PHALARIS L.

Panicle spike-like or branched. Spikelets awnless, with one hermaphrodite floret and 2 rudimentary florets at the base, reduced to scales. Glumes boat-like with a well-marked or winged keel. Palea boat-like. Includes 10 species natives of the Mediterranean region as far as Afghanistan, temperate America; naturalised elsewhere.

PHALARIS TRUNCATA Guss. Plant perennial, caespitose, somewhat nodose at the base, with fibrous roots. Stems 3 to 8 diameter high. Leaves linear-acuminate. Glumes with a broadly winged keel, the wing being truncated-rounded just below the apex. Hermaphrodite florets with paleae minutely villous, and with 2 very small rudimentary florets at the base. (P) South Europe and North Africa. April-June. *Malta*, very rare, at Wied Babu according to Delicata.

PHALARIS TUBEROSA L. Plant perennial, u.s. Stems oblique or almost creeping, nodose and tuberoso at the base, 5-12 diameter long. Glumes with green keel, and a narrow entire wing. Hermaphrodite florets with paleae villous with applied hairs, and with a rudimentary neutral floret like a scale at the base. The rest u.s. (P) Mediterranean region and the Canaries. March-June. *Malta*, rather rare, at Imtahleb, Wied ir-Rum, Bahria, Ghirghenti, Ghain il Cbira, Gneina, Marfa, Wardia etc-*Phalaris nodosa* L.

PHALARIS PARADOXA L. Plant annual with fibrous roots. Stems mostly erect 2 to 8 diameter high. Leaves u.s., the uppermost leaf with the sheath swollen and partly enveloping the inflorescence. Lower spikelets of the panicle deformed and abortive. Glumes acuminate mucronate, with the keel expanded into a tooth-like wing. Hermaphrodite florets with glabrous paleae, and with 2 rudimentary neutral flowers at the base. (A) Mediterranean region, Madeira, the Canaries, Abyssinia. April-June. *Malta*, *Gozo* and *Comino*; common in fields, valleys, and chiefly in fields of sula and among growing crops.

PHALARIS CAERULESCENS Desf. Plant perennial, caespitose. Leaves and stems u.s. Glumes often suffused purple, with a broad toothed wing. Hermaphrodite florets with glabrous paleae; residue of neutral flowers wanting or reduced to bristle-like processes. (P) Mediterranean region, Madeira, the Canaries. March-June. *Malta*, in valleys and moist localities; at Wardia, San Martin, St Paul's Bay, Wied ir-rum, Bahria, Ghirghenti, Imtahleb, Wied Balluta.-*Phalaris aquatica* L.

PHALARIS MINOR Retz. Plant annual, caespitose, more or less slender, with stems 2 to 5 diameter high. Panicle more or less protruding, or entirely protruding, from the upper most swollen leaf-sheath. Glumes acute, but not

mucronate, with toothed wing. Hermaphrodite florets with paleae villous with applied hairs, and with a very small filiform residue of a neutral floret at the base. (A) Mediterranean region as far as Afghanistan, South Africa, the Canaries. March-June. *Malta*, *Gozo* and *Comino*, very common in fields, valleys and among growing crops. The form: *gracilis* Parl., with a shorter panicle, and with the blade of the uppermost leaf very short, is frequent on uncultivated ground and in fields, especially late in the season. M. Scalora *salvaggia*.

PHALARIS CANARIENSIS L. Plant u.s. Stems 4 to 10 diameter high. Panicle ovate-oblong. Two neutral florets at the base of the hermaphrodite floret reduced to lanceolate keeled scales, half the length of the fertile floret. The rest u.s. (A) Native of the Canaries; occasionally cultivated in *Malta* and *Gozo*, for its seed which is fed to canary-birds and other small song birds. Often found self-sown. E. Canary-seed. I. Scagliola, Canaria. M. Scalora.

#### ANTHOXANTHUM L.

Panicle spike-like or racemose. Spikelets made of one hermaphrodite floret, and two lateral paleae, reddish, villous, with unequal awns. Lower glume smaller than the upper. Paleae of fertile floret small, spoon-shaped. Stamens 2. Includes 4 species, natives of Europe and temperate Asia; one being found also in North America and Australia; naturalised elsewhere.

ANTHOXANTHUM ODORATUM L. Plant caespitose, glabrous or with foliage more or less hairy, with a pleasant odour of hay when dry. Stems ½ to 3 diameter high. Leaves flat, somewhat hairy on both surfaces. Panicle oval or cylindrical, narrowed at the base, 3 to 10 cm long, spike-like, with numerous spikelets 6 to 7 mm long. Glumes 2, the lower much smaller than the upper. Spikelets with one hermaphrodite flower which is awnless, and 2 lateral paleae of neutral flowers, villous, unequally awned, about twice as long as the fertile floret, but with the longer awn hardly exerted from the upper glume. (P) or (A) Europe, Central and Northern Asia, North Africa, Atlantic Islands; naturalised in North America etc. March-June. *Malta*, very rare, at the Marsa not found again after *Delicata-Anthoxanthum glabrescens* Celak. E. Sweet-scented spring-grass. I. Paleo, Paleino odoroso.

ANTHOXANTHUM GRACILE Biv. Plant slender, annual, caespitose. Stems 1 to 2 diameter high. Leaves u.s., hairy. Panicle racemose, loose, with large spikelets 10 to 12 mm long, glabrous, silvery and shining, with the larger awn protruding far from the glume. Neutral paleae twice as long as the hermaphrodite floret. The rest u.s. (A) Italy, Sicily, Sardinia, Greece etc. April-May. In rocky places and valleys. *Malta*, frequent in valleys and on uncultivated and stony ground. *Gozo*, likewise frequent in similar localities. *Comino*, on hill near Kala Santa Maria.

#### TRIBE VI-STIPEAE.

Spikelets solitary, alternate, all hermaphrodite, compressed at the back or cylindrical, jointed above the glumes, consisting on only one hermaphrodite

floret. Glumes 2, not shorter than the floret. Paleae 2, the lower coriaceous, lied to the caryopsis and almost always funished with a long awn. Stigmas included or only half exserted.

### STIPA L.

A spike like panicle. Spikelet with one hermaphrodite floret, sessile or stipitate. Glumes lanceolate, awl shaped at the apex, longer than the paleae.

often very long and thick. Includes about 100 species, natives of tropical and temperate regions.

STIPA TORTILIS Desf. Plant annual, with few erect stems, or knee- -filiform, with a

Awn 8 to 10 cm long, curved knee- and spreading hairs; scabrous in its upper part. (A) Mediterranean region, -May. and , veryb common in valleys and on uncultivated and stony ground.

STIPA PENNATA L. is occasionally cutlivated for ornament. Mentioned by - grass.

### MILIUM L.

Inflorescence a panicle. Spikelets with only one hermaphrodite floret. 3- - nerved. Species about 30, mostly natives of warm and temperate regions,

stoloniferous. Stems erect, 5 10 diameter high. Leaves linear rather broad, scabrous along the margin, with elongated ligule. Panicle pyramidal, open,

(P) Europe, Siberia, Central Asia and the Himalayan region, and North -June. , in arid localities, at Corradino, according to Delicata. E. Millet grass.

MILIUM VERNALE M.B. Plant annual, usually caespitose; stems 2 to 3 diameter high. Leaves short and narrow, line diameter long, with semi- elongated and spreading. Glumes tuberculate and scabrous. The rest u.s. (A) Central and Southern Europe, the Caucasus, Northern Africa and pril- -Miliun scabrum Rich. The typical form has not been

Var. *Montianum* Parl. Stems leafy up to their apex. Branches of panicle usually simple and undivided. Oriental Mediterranean region. *Malta*, very rare, in moist localities. At Wied Encita, according to *Delicata*.

**MILIUM MULTIFLORUM** Cav. Plant perennial, more or less caespitose. Stems erect or nodding, 4 to 10 diameter long. Leaves linear, narrow, becoming convolute. Panicle large and full, with whorled branches, a few of the lower branches usually being sterile. Glumes unequal; spikelets oval, small, about 4 mm long. Awn twice as long as the palea. (P) Mediterranean region, Atlantic Islands, Arabia. April-August. *Malta*, *Gozo* and *Comino*, common in rocky and stony places, along field walls, and on uncultivated ground.-*Agrostis miliacea* L.-*Piptatherum multiflorum* P.B.-P. *miliaceum* Coss.-*Oryzopsis miliacea* Asch. et Schwf. M. Barrum.

#### TRIBE VII-AGROSTIDEAE.

Spikelets solitary, alternate, all hermaphrodite, compressed at the sides, with only one hermaphrodite floret, or with a rudimentary floret above it. Glumes 2, subequal, as long as the floret or longer, very rarely wanting. Paleae 2, membranous, loosely enveloping the caryopsis. Stigmas protruding.

#### CORNUCOPIAE L.

Spikelets one-flowered, hermaphrodite, capitate, in tubular-campanulate involucre which is toothed at the rim, sessile and jointed. Glumes 2, the outer membranous, conduplicate-keeled, subequal, with a ciliated or winged keel, 3 to 5 nerved. Lower palea longer, broad, transparent, indistinctly nerved, enveloping the floret, forming a funnel-shaped tube, with more or less connate margins, with a short awn or process inserted below the middle of back. Stamens 3. Styles distinct, stigmas plumose. Caryopsis oval-oblong, free, within the paleae. Includes one-species.

**CORNUCOPIAE CUCULLATUM** L. Plant annual, caespitose, small, with flat narrow linear leaves, stems kneeled at the base. Leaves with broad sheath, the uppermost sheath being broad; 2 or 3 peduncles issue from this sheath, thickened or club-shaped above, recurved, each bearing a funnel-shaped involucre, herdened, having 8-10 teeth along the rim, within which there is a cluster of sub-sessile spikelets. Glumes subequal connate at the base, abrupt, keeled. Palea reduced to one, the lower, subequal to the glumes. (A) Western Asia. March-April. *Gozo*, rare, in a ditch along the road around Victoria to Zebbug.

#### *Crypsis* Ait.

Inflorescence spike-like or a head. Spikelets with only one hermaphrodite floret. Glumes keeled, acute, just shorter than the florets. Paleae awnless, keeled, 1 to 2-nerved. Stamens 2 or 3. Styles elongated, with stigmas protruding at the apex. Includes 9 species, natives of the Mediterranean region, 2 of them extending to Western and Central Europe and to Central Asia.

CRYPSIS ACULEATA (L.) Ait. Plant annual, with stems prostrate all round, very rarely ascending, 3 to 30 cm long. Leaves with short, linear, flat,   
ated and swollen. Spikes formed like a head, hemispherical, with discoid axis, surrounded with an

below the glumes. Upper paleae one-  
Mediterranean region as far as India, Siberia, Senegal. June September.

*Malta*

Ghadira is-

-Ciaghak and Saline, where it is frequent;  
elicata.-

-like. Spikelets with one hermaphrodite floret, usually with a  
-shaped, keeled, mucronate awned.  
Paleae shorter than the glumes, the lower truncated toothed, the upper with

apex of the spikelet. Includes about 10 species, natives of Europe, North Africa, Central and Northern Asia, North and South America.

PHLEUM SUBULATUM Asch. et

stems erect, often reddish, 1 to 4 diameter high. Leaves linear, flat, rather short, glabrous. Panicle oblong cylindrical. Glumes coriaceous, glabrous, shortly and obtusely mucronate, semi oval, with converging apex. Spikelets

Lower palea 5-

as far as the Caucasus. April- *Malta*, very rare; among growing crops at  
omor according to Delicata.- -Ph. tenuis Host.

Phleum tenue Schrad.

at the base, 1 to 5 diameter high. Leaves linear, flat. Panicle obtuse, cylindrical, green,  
the hermaphrodite one. Glumes ciliated, with a glabrous short awn, shorter than the glumes. Sheath of upper leaf now swollen. (P) Europe, Central and  
h America. April- *Malta*, very  
-grass, Timothy

-like. Spikelets with only one hermaprodite floret, without  
Glumes boat-  
the base, awnless or awned. Palea only one, keeled, awned at the back, or two the lower being awned and the upper one nerved. Stigmas exserted at the apex. Includes about 20 species, natives o  
of which 2 or 3 have become broadly naturalised in many countries.

ALOPECURUS PRATENSIS L. Stems erect or keeled at the base, 3 to 10 diamter long, with a short oblique rhizome. Leaves linear, flat, 4 to 10 mm

broad; ligule up to 4 mm long; sheath or uppermost leaf not swollen. Panicle deep green, cylindrical, obtuse. Glumes connate for the lower third, not divergent, ciliated and villous along the nerves. Palea one, very rarely two, about as long as the glumes, with an awn twice as long. (P) Europe, Western and Central Asia as far as Siberia, North Africa, North America. March-June. *Malta*, rare, at the Marsa along the water-course. E. Fox-tail grass. M. Demb il Giurdien.

## LAGURUS L.

Panicle spike-like, spikelets with one hermaphrodite floret, and with a bearded rudimentary floret above it. Glumes subequal, subulate-acuminate, villous with long hairs. Lower palea bifid and awned at the apex, with a second keeled awn inserted at the back; upper palea with 2 teeth and 2 keels. Stigmas exerted at the base. Includes only one species.

LAGURUS OVATUS L. Plant hairy and soft, with thick tomentum. Stems few or solitary, erect, 1 to 5 diameter long. Leaves linear, rather broad. Panicle dense, oval, whitish and villous. (A) very rarely (B) Mediterranean region as far as the Caucasus, Atlantic Islands. March-June. *Malta*, *Gozo* and *Comino*, common in valleys, on uncultivated ground, along roads etc. E. Hare's tail grass. I. Piumino. M. Demb il fenech or Demb il Kattus, or Mustacc il kattus.

Var. *nanus* Guss. Stems mostly solitary, up to 1 diameter long; panicle roundish or round. Common in the more arid localities.

Var. *multicaulis* mihi. Stems numerous, usually more than 10, and up to 40, of various sizes, from 5cm to 20 cm. Panicles on the Valletta and floriana glacis, cottonera, Boschetto etc. The plant is usually biennial.

## POLYPOGON Desf.

Panicle dense. Spikelet with only one floret, hermaphrodite. Glumes subequal, awned. Lower palea abrupt-toothed, awnless or with an awn below the apex; upper palea with 2 keels; both paleae much smaller than the glumes. Stigmas exerted at the base. Includes about 10 species, broadly dispersed chiefly in temperate and subtropical regions.

POLYPOGON MONSPELIENSIS Desf. Root fibrous. Stems erect or ascending or kneeled, not tooting at the base. Leaves linear, glabrous; ligule lanceolate-laciniate. Panicle oblong, very dense, often lobed, whitish, sometimes flushed purple; lower palea half as long as the glumes. (A) Almost cosmopolitan. March-May. In weedy places and in valleys. *Malta*, frequent on the Floriana and Valletta glacis, hamrun, Attard, St Paul's Bay, Ghirghenti, Boschetto, Bahria, Imtahleb etc; frequent also in gardens and along country roads. *Gozo*, at Xlendi, Ta Giurdan, Rabato, Via Marsalforno. -*alopecurus monspeliensis* L. -*Cynosurus paniceus* Forskaal. E. Annual Beard-grass. M. Demb il libru.

slightly swollen above, the panicle being well exerted from the uppermost middle. Glumes bifid, with the awn inserted between the lobes, with silvery scales below. Lower palea awnless. (A) Mediterranean region as far as an, Atlantic Islands. March- *Malta*, Gozo and , common in moist localities and in shaded valleys. The form: *acutifolius* Guss., with form.

Var. *subspathaceus* Req. Uppermost leaf with the sheath greatly swollen and more commonly purplish. Spikelet with the peduncle jointed below its middle. Plant smaller, usually prostrate. With the typical for gardens at Attard, Lia, Musta, Birchircara, and at Wied Encita. E. Beard-libru.

#### GASTRIDIDIUM P.B.

Panicle spike like. Spikelets with only one floret, hermaphrodite. Glumes acute, awnless, restricted on the especially along the keel. Lower palea abrupt-kneeled awn inserted at the back, or awnless. Stigmas exerted at the base. Includes only one species

GASTRIDIDIUM VENTRICOSUM Schinz e and ascending, 1 to 4 diameter high. Leaves linear, becoming convolute. Panicle spike like, oblong, acute at both ends. Glumes lanceolate, acuminate. Lower palea almost always awned and hirsute. (A) Western , the Mediterranean region, Abyssinia, Canaries, Madeira; naturalised in California, Chili and Tasmania. March May. In fields and on uncultivated and rocky ground; frequent here and there in and *Comino* common at Boschetto and Dingli.- *grostis ventricosa* Gouan.- *lendigerum* L.- -*Agrostis australis* L. *Gastridium australe* P>B> e. Nit grass.

-*Gastridium muticum* Guenth. Glumes more scabrous, glabrous. Panicle usually dense and contracted even during flowering. With the typical form, but less *Malta*, at Boschetto, wied Zhuber, Dar il Bajda, Fauuara, Wied

-like. Spikelet with only one flore constricted, and hardly ventricose at the base, awnless. Lower palea with 2 bristle like appendages and with a basilar awn, kneeled and twisted, as long as the glumes. Stigmas exerted at the base. Includes only one species

becoming convolute; uppermost sheath swollen. Panicle oval, dense,

contracted. (A) Sicily, Pantelleria, Pelagic Islands, North Africa, Spain, Canaries, Cilicia and Cyprus. March-May. *Malta*, rare, on sandy beaches, at Marfa in the Ramla tal Kortin and Ramla tal Bir.-*Agrostis nitens* Guzz.

#### SPOROLOBUS R. Br.

Panicle various. Spiklets u.s. Glumes unequal, the lower shorter than the paleae, both awnless. Paleae equal to each other and awnless. Stigmas u.s. Caryopsis furnished with a transparent dehiscent pericarp. Includes about 80 species, natives of warm and temperate regions, mostly of America.

SPOROLOBUS ARENARIUS Duv.-Jouve. Rhizome creeping. Stems compressed, 1 to 2 diameter high. Leaves short, distichous, convolute and rigid; a tuft of hairs replacing the ligule. Panicle small, oval-lanceolate. (P) Mediterranean region and Cape Verde Islands. July-September. *Malta*, rare, at Marfa, Melleha, St Paul's Bay, Bugibba; on sandy beaches and in fields close to the sea. *Gozo*, at Marsalforno, Kbaijar, and Ramla where it is common. *Comino*, similar localities; Kala Santa Maria.-*Agrostis arenaria* Gouan.-*A. pungens* Schreb.-*Vilfa pungens* P.B.-*Sporolobus pungens* Kunth.

#### AGROSTIS L.

Panicle various. Spikelets with only one hermaphrodite floret, with or without a rudiment of neutral floret. Glumes keeled, acute, awnless. Lower palea 3-nerved, awnless, or with a basilar or dorsal awn: upper palea much smaller, with 2 keelds, or wanting. Stigmas u.s. Includes about 100 species, dispersed all over the world, mostly in temperate regions of the northern hemisphere.

AGROSTIS SPICA-VENTI L. Stems erect, usually few or solitary. Leaves linear, flat; ligule elongated and lacinate. Panicle with semi-whorled branches, more or less flushed purple, ample and spreading, with trichotomous branches. Anthers linear-oblong. Glumes lanceolate, acute, scabrous along the nerves. (A) Central and Southern Europe, Algeria, Caucasus, Siberia. April-May.-*Apera Spica-venti* P.B. E. Wind-grass, Windle-straw.

Var. *interrupta* L.-*Apera interrupta* P.B. Stems slender, with only 2 nodes, 2 to 4 diameter high. Panicle narrow; branches usually simple. Anthers oval-roundish. Western and Central Europe, North Africa. April-May. *Malta*, here and there, at the Marsa, possible introduced with lawn-grasses.

AGROSTIS ALBA L. Stems erect, or kneeled and ascending, 1 to 15 diameter high, usually stoloniferous. Leaves linear, flat, afterwards becoming convolute, soft, green, with an abrupt ligule 2 to 3 mm long. Panicle more or less loose, ample, pyramidal, with branches naked at the base, or some of the branches short and furnished with spikelets to their base, greenish, violet or reddish. Spikelets 2 to 3 mm long: glumes acute, scabrous along the keel. Lower palea abrupt-toothed, 5-nerved, awnless or with a short awn at the middle of the back; paleae unequal. (P) Europe, Western Central and Norther



Asia, North and East Africa, Atlantic Islands, North America. April-July. *Malta*, rare, at the Marsa and Wied Hanzir. E. Fine-top-gras. I. Capellini.

Var. *verticillata* Vill.-*Agrostis stolonifera* L. p.p. Panicle ovate-oblong, dense, lobed, with short branches, all densely covered with spikelets down to the base. Glumes obtuse, minutely hairy; paleae subequal to each other. Leaves flat, not convolute. (P) Mediterranean region, Western Asia to India, Arabia, Abyssinia, Atlantic Islands: naturalised in South Africa and Mexico. April-October. *Malta*, frequent, at Gneina, Ghain Tuffieha, Gnien il Cbir, Boschetto, Ghirghenti, Ghain il Cbira, Imtahleb, Fiddien etc. Gozo, at Wied ir-Rihan, Wied il Lunziata, Xlendi, Imgiar ix-Xini etc.

#### AMMOPHILA Host.

Panicle spike-like, cylindrical. Spikelet with one hermaphrodite floret, with or without rudimentary floret above it. Glumes keeled, acute or acuminate. Lower palea 5-nerved, with 2 teeth and mucronate at the apex, with a ring of silky hairs at the base, about one-third as long as the palea. Includes 4 species, 2 of which are natives of North America, and the others are broadly dispersed on the beaches of the northern hemisphere.

AMMOPHILA ARENARIA Link. Rhizome creeping. Stems caespitose, erect, 5 to 8 diameter high. Leaves stiff, convolute, acute and prickly, with a long bifid ligule. Panicle whitish. (P) Central and South Europe, North Africa and North America; on sandy beaches. April-June. *Malta*, common on the sandy beaches of the various inlets at Ahrax (Marfa), at Melleha and St Paul's Bay.-*Arundo arenaria* L.-*Psamma arenaria* R. et S.-P. *litoralis* P.B. e. Sea mat-weed. I. *Sparto pungente*.

Var. *arundinacea* Host. Panicle longer, from 20 to 30 cm long. Spikelets longer, with acute glumes, with more abundant and longer silvery hairs. Leaves rigid, rush-like, more acute.-*Psamma australis* Mabilie. *Malta*, with the type at Marfa (Ramla tal Kortin) and at Melleha.

#### TRIBE VIII-ARUNDINEAE.

Spikelets solitary, alternate, all hermaphrodite, compressed at the sides, jointed above the glumes, with 2 to 6 hermaphrodite florets, rarely with a rudimentary floret above them. Paleae villous at the back or at the base; often with 2 or 3 teeth at the apex. Stigmas about half exerted.

#### ARUNDO (Tourn.) L.

Panicle large, oblong, acute at both ends. Spikelets with 2 to 6 hermaphrodite florets, or sometimes with only one or two, the upper one being rudimental. Glumes subequal to the flowers, acute 3-nerved. Lower palea 5-nerved, shortly awned, apex bifid or entire, villous at the back; upper palea small, with 2 keels, abrupt. Includes 6 species, natives of the Mediterranean region. Includes 6 species, natives of the mediterranean region, East Indies and the Malay Archipelago, Madagascar, New Zealand, Central and South America.

ARUNDO DONAX L. Rhizome thick, knotty. Stems thick, hollow, erect, 2 to 4 m high. Leaves large, linear, lanceolate, more or less glaucous, distichous, with a ciliated, very short ligule. Panicle large, dense, purplish, 2 to 5 diameter long. Lower palea bifid at the apex, with hairs as long as the glumes. (P) Mediterranean region, as far as the Caspian Sea. September-October. *Malta*, *Gozo* and *Comino*, cultivated, and often naturalised in valleys etc., possibly a true native.-Donax Donax Asch. et Graeb. E. Common-reed, Great reed. I. Canna. M. Kasba.

ARUNDO PLINII Turra. Rhizome less thick, knotty, often partly stoloniferous. Stems rigid but slender, hollow, about 4 to 7 mm thick, and up to 15 diameter high. Leaves narrow, linear, glaucous, often intensely glaucous. Lower palea entire at the apex, acuminate-awned; hairs shorter than the glumes. Panicle 1 to 3 diameter long, rather broad and purplish. (P) Western and Southern Europe, Balkan Peninsula, and North Africa. July-October. *Malta*, Boschetto Ghirghenti and especially at Ghain il Cbira.-Arundo Pliniana Turra.-Donax Plinii C. Koch. I. Canna del Reno. M. Ghaljun or Kaljum

Var. mauritanica Desc.-Donax mauritanica P.B. Panicle more slender, white. Spikelets always 2-flowered, not compressed. Stems usually longer. *Malta*, rare, along walls of fields at Mistra.

#### PHRAGMITES Adans.

Panicle various. Spikelets with 3 to 8 florets, the lower floret being male and naked with a glabrous axis, the others hermaphrodite on a flexuous axis furnished with a tuft of long hairs at the insertion of the florets. Glumes very acute, shorter than the florets. Lower palea acuminate-subulate; the upper small with 2 keels. Includes only one species.

PHRAGMITES COMMUNIS Trin. Rhizomes creeping, with long stolons, often going deep into the soil. Stems erect, hollow, 1 to 3 m long, usually 5 to 10 mm in diameter. Leaves linear-lanceolate, rather broad and long, green or glaucous, with a tuft of hairs instead of ligule. Panicle large, up to 3 diameter long, erect or inclined on one side, yellowish or purplish brown. Spikelets usually with 3 to 6 florets, rarely less. Glumes very acute, the lower shorter. Lower palea about twice as long as the upper glume, acuminate subulate. (P) Almost cosmopolitan. June-October. *Malta*, in fields and moist places; frequent and often very common; at Saline, Marsascirocco, Marsascala, Ghain il Cbira, Gnien il Cbir, Bugibba, Puales, Ghain Tuffieha etc. *Gozo*, Migiarr, Imgiar ix-Xini, Marsalforno, Kala Dueira. *Comino*, at the head of Kala Santa Maria-Arundo Phragmites L.-A. Phragmites var. legitima Asch. et Graeb. E. Common reed. Spire-reed. I. Canna di palude, Canna da spazzole. M. Kasbiet ir-rih.

Var. humilis D. Ntrs.-Phragmites pumila Wk.-Arundo Phragmites var. humilis Asch. et Graeb. Stems usually much shorter, never exceeding 15 diameter in length. Leaves shorter and narrower. Panicle more slender and denser, reddish-brown, not more than 2 diameter long. Spikelets usually with 7 or 8

florets. With the typical form at Saline. , Ramla (Gozo obably elsewhere.

#### AMPELODESMA P.B.

Panicle large, oblong. Spikelets with 2 to 5 hermaphrodite florets. Glumes silky hairs at the base, with 2 teeth at the apex, mucronate between the teeth, Includes only one species.

AMPELODESMA MAURITANICA Dur. et Schinz. Plant extensively caespitose; stems erect, stiff and tough, not hollow, 10 to 15 diameter high. Leaves linear, very long, shining green, scabrous along the margin, later becoming convolute. Panicle loose, spreading, mostly unilateral and curved, -whorled branches, spikelets variegated, with 2 to 5 florets all editerranean region, Dalmatia and Zante. April-  
*Malta*, rare; only found in the lower part of Wied Gherzuma. *Arundo mauritanica* Poir *A. tenax* Vahl.- -tie.

color Kunth-  
growing on poor rocky ground, with a more erect and denser panicle, and spikelets of only two florets, the upper of which is sterile and almost

-*Arundo dioica* Spr. *Gynerium argenteum*  
cultivated for ornament.

#### TRIBE IX-

sides, usually jointed above the glumes, with 2 or more florets, the terminal entire spikelet. Lower palea awned at the back, rarely awnless. Stigmas exerted at the base.

#### AIRA L.

Panicle with spikelets having 2 hermaphrodite floret upper pedicelled. Glumes equal, covering the florets or shorter than the same. Lower palea naked at the back, bifid or abrupt at the apex, with a 2 keels and with 2 apical teeth. Includes 10 species, natives of Europe, and regions.

AIRA CARYOPHYLLEA L. Stems filiform erect, 10 to 30 high. Leaves setaceous, convolute. Panicle

or less spreading. Spikelets 2 to 3 mm long, with acute glumes finely toothed at the apex: lower palea bicuspidate at the apex, hairy at the base. Pedicels once or twice as long as the spikelets. Florets both awned, or even only one. (A) Central Europe, the Mediterranean region, Abyssinia, South Africa, Atlantic Islands: naturalised in temperate America. April-May. *Malta*, Wied Babu, according to *Delicata-Avena caryophyllea* Web. E. Mouse-grass. I. Nebbia, Capellini.

AIRA CAPILLARIS Host. Stems and leaves u.s. Panicle very spreading, with peduncles 3 to 5 times as long as the spikelets. Spikelets 1½ to 2 mm long, with one or two awns about twice as long as the glumes which are eroded at the apex and often apiculate. Lower palea bifid at the apex, glabrous, or slightly hairy at the base. (A) Mediterranean region. March-May. *Malta* and Gozo, frequent here and there; as on the Valletta and Floriana Glacis, Marsa, Wied Encita, Zebbug, Zabbar, etc.-*Aira corsica* Jord. E. Bent-grass.

Var. *Cupaniana* guss.-*Avena Cupaniana* Nym. Panicle more or less contracted and dense. Peduncle about 3 times as long as the spikelet, which is 2 mm long, with glumes eroded at the apex. *Malta* and Gozo; more frequent than the typical form, and often common, in arid and exposed situations.

#### SCHISMUS Beauv.

Spikelets many-flowered, in dense panicle on a very fragile axis: florets hermaphrodite, or the uppermost abortive. Glumes 2 persistent, membraneous, acute, 3 to 5-nerved, subequal, equal to or just shorter than the spikelet; lower palea shorter, imbricate, broad and bifid at the apex, awnless or shortly mucronate between the lobes. Upper palea shorter, transparent, broad toward the tip, 2-keeled. Stamens 3, anthers short. Styles distinct, stigmas plumose. Caryopsis obovate, loosely enclosed in the paleae. Panicle dense or loose, erect. Plant usually small: leaves very narrow or setaceous. Includes 3 to 4 species: 2 or 3 being natives of South Africa and the following being found throughout the eastern Mediterranean region, Arabia and Afghanistan.-*Hemisacris* Steud.-*Electra* Panz.

SCHISMUS MINUTUS Roem. et Schult. Plant annual, dwarf, leaves setaceous. Stems erect, stiff, often solitary. Panicle dense spike-like. (A) April-May. *Malta*, very rare, along country roads near Santa Venera (Hamrun).-*Schismus arabicus* Nees.-*S. spectabilis* Fig. et De Not.

#### TRisetum Pers.

A panicle, sometimes spike-like. Spikelets with 2 to 6 hermaphrodite florets, the lower sessile and the others pedicelled, the uppermost often sterile or rudimentary, hairy at the base or naked. Glumes unequal; the lower one-nerved, smaller than the upper which is 3-nerved, usually not entirely enveloping the florets. Lower palea bifid or with 2 teeth, with a dorsal awn mostly keeled and flexuous; the upper palea bifid. Ovary glabrous or slightly

hairy. Caryopsis without a ventral groove. Includes about 50 species, natives of temperate and mountain regions.

TRisetum AUREUM Ten. Stems caespitose, often to 4 dm long, with flat leaves, linear, hairy or glabrous. Panicle oval, dense, with branches naked at the base. Spikelets glabrous and shining, with awn less than twice its length. (A) Italy, Sicily, Dalmatia, Greece and Thrace. -May. and *Comino* -Trisetum  
-Trisetum melitense Steud. Avena pumila D'Urv.-  
condensata Link.-

the uppermost one being often sterile, and all mostly bearded at the base. Glumes more or less equal to each other, and often slightly longer than the lemmas. Lower palea spoon-shaped. Upper palea with 2 keels, ciliated or rarely glabrous. Ovary very villous: caryopsis with a ventral groove. Includes about 40 species, mostly natives of the eastern hemisphere.

AVENA SATIVA L. Stems solitary or caespitose, erect, 5 to 15 dm high. Leaves linear lanceolate, with a short abrupt ligule. Panicle large, pyramidal, more or less loose, with branches semi-whorled naked at the base. Spikelets jointed on their axis, and therefore not caducous at maturity unless broken off, and often beardless at the base. (A) Central Europe, Mediterranean region, Africa, Atlantic Islands: cultivated and naturalised in many countries. The subspecies: sativa Fiori, consisting of several well-known varieties, is very rarely cultivated in the Maltese Islands, but is occasionally met with self-sown, accidentally imported with other seeds. E. Oats. I. Avena.

-species: fatua Fiori. Florets all or at least the lower 1 or 2, jointed and

attached all round, loose. Leaves glabrous. Spikelets with 2 or 3 florets. Lower palea shortly bifid or awned. (A) Central Europe, the Mediterranean region, Central Asia as far as March. Malta, rare; here and there among growing crops of sallow, wheat

-Avena macrocarpa Moench. Panicle u.s. but mostly  
Spikelets with 3 to 4 fertile florets, the lower 1 or 2 bearded and awned u.s. The lower 1 or 2 florets jointed at the base and caducous; the upper 1 or 2 not  
-May.

*Malta, Gozo and Comino*, frequent and often very common among growing crops, here and there also on uncultivated ground and in valleys.

Var. *barbata* Pott.-*Avena hirsuta* Moench. Leaves and sheaths mostly hairy. Panicle always unilateral. Spikelets with 2 or 3 bearded florets: awn kneeled and tortuous. Lower palea with two cuspidate teeth or segments at the apex. (A) Western Europe, Mediterranean region, Persia and Mesopotamia, Canary Islands; naturalised elsewhere. March-June. *Malta, Gozo and Comino*; common among growing crops, along walls of fields, country-roads and on uncultivated and rocky ground.

#### TRIBE X-CHLORIDEAE.

Spikelets all hermaphrodite, with one or more florets, in 2 or more rows on one side of the axis, compressed at the sides and usually jointed above the glumes, forming spikes with a rachis neither jointed nor grooved. Glumes 2, well developed. Lower palea awnless or mucronate. Stigmas exerted at the base.

#### CYNODON Rich.

Spikes digitate. Spikelets with 1 hermaphrodite floret, and with an upper rudimentary one. Glumes keeled, shorter than the floret; lower glume smaller. Lower palea 3-nerved, broad, keeled; the upper very narrow, with 2 keels. Includes 4 species, one of which is cosmopolitan, the others are natives of Australia.

CYNODON DACTYLON (L) Pers. Rhizome very long, creeping, stoloniferous, branched. Stems ascending, 1 to 3 diameter high, branched at the base. Leaves linear, flat, short, ciliated. Spikes 3 to 7, digitate, spreading, linear, mostly violet. Spikelets in 2 series on one side. (P) Cosmopolitan. April-November. *Malta, Gozo and Comino*; very common everywhere; a troublesome weed.-*Panicum Dactylon* L. E. Doub-grass, Couch-grass. I. Gramigna, Capriola. M. Nigem.

#### ELEUSINE Gaertn.

Spikes digitate. Spikelets compressed, with 2 or more hermaphrodite florets. Glumes keeled, shorter than the florets, awnless. Lower palea boat-shaped, keeled, awnless, 3-nerved: upper palea with 2 keels. Caryopsis with loose membranous pericarp. Includes 3 species, natives of tropical and subtropical regions of the eastern hemisphere.

ELEUSINE INDICA (L.) Gaertn. Plant caespitose, with erect or ascending, compressed stems, 1 to 6 diameter long. Leaves linear, flat, mostly hairy at the insertion with the sheath: ligule short, slightly ciliated. Spikes 2 to 7, digitate, rarely reduced to 1, linear and slender, 3 to 10 cm long, with spikelets in 2 series, unilateral, with 3 to 7 florets. Caryopsis oblong, rugose. (A) Native of intertropical regions of Africa and Asia; naturalised in intertropical

-October. *Cynosurus indicus*

L.

Var. *coracana* Gaertn. Seeds subglobose, finely rugose. Spikelets in 4  
incurved. *Cynosurus coracanus* L.- *Malta*, rare;  
accidentally with flower-

#### -FESTUCEAE.

Spikelets solitary, alternate, or rarely in 2 series, with 2 or more  
hermaphrodite florets, compressed at the sides and jointed above the glumes.  
Glumes shorter than the florets, rarely subequal to them. Lower palea

a head. Spikelets with 1 to 5 hermaphrodite florets, the  
upper sometimes sterile. Glumes shorter than the florets, the lower broad at  
terminating with 5 to 7 unequal divergent spiny teeth, the upper terminating

Includes only one species.

*ECHINARIA CAPITATA* Desf. Stems solitary or very few, erect, stiff, 5 to 15  
cm long, with short linear flat leaves. Her  
diverging spines. Glumes with one or 2 long teeth. Lower palea with 5 spines,  
and the upper with 2 long teeth. (A) Mediterranean region. March May.  
*Gozo*, -Rihan near Nadur. *Ceuchrus echinatus*  
-*Sesleria echinata* Lam. E. Hedge hog Plant.

#### KOELERIA Pers.

Panicle spike-  
upper rudimentary floret. Glumes unequal, keeled, mucronate, subequal to  
the florets. Lower palea keel  
awnless at the apex; the upper palea with 2 keels and 2 teeth. Includes about  
12 species natives of Europe, the Mediterranean region, temperate Asia,

S Pers. Panicle cylindrical, elongated, more or less  
lobed and branched, variegated white and green, spreading when in flower.

with very short awn. Glumes glabrous or villous. (A) Mediterranean region,  
-May.

*Gozo*, *Comino* and ; common in fields and on uncultivated ground.-  
-f. *phleoides* Vill.

#### AVELLINIA Parl.

Panicle more or less spike-like. Spikelets with 3 to 4 florets, the uppermost sometimes rudimentary. Glumes very unequal, the lower lanceolate subulate, very much shorter than the upper which is about 4 times as long, almost longer than the florets. Lower palea narrow, convolute, with 2 apical teeth with a short awn between them. Includes only one species.

AVELLINIA MICHELII (Savi) Parl. Stems slender, erect or kneeled, 1 to 3 diameter long. Leaves and sheaths minutely hairy, with a very short ligule. Panicle spike-like, becoming contracted after flowering. Spikelets glabrous. (A) South Europe and North Africa. March-April. *Malta*, rare; at Ghirghenti, Ghain il Cbira and Inquisitor's Palace in fields and rocky ground behind it. *Bromus Michelii* Savi.-*Vulpia Michelii* Rehb.-*Koeleria macilentia* D.C.

### CYNOSURUS L.

Panicle unilateral, linear or globose, racemose. Spikelets ditichous, fertile mixed with sterile; the first consisting of 1 to 5 hermaphrodite florets, the sterile consisting of linear glumaceous bracts. Glumes acute, subequal, about as long as the florets. Lower palea with 3 to 5 nerves, mucronate, or awned. Includes four species, natives of Europe, the Mediterranean region and the Canaries; naturalised elsewhere.

CYNOSURUS CRISTATUS L. Raceme spike-like, linear, 3 to 9 cm long, with simple rachis. Spikelets fertile or sterile, the fertile with 3 to 4 hermaphrodite florets with mucronate paleae: the sterile with smooth paleae, rarely hairy along the keel. Plant perennial, with erect stems, 2 to 5 diameter high; and flat linear leaves, with an abrupt ligule. (P) Europe and the Mediterranean region. April-June. *Malta*, rare, Wied Babu, and Ramla tal Maroc, according to Delicata and Gulia. E. Dog's tail.

CYNOSURUS ECHINATUS L. Plant annual, with erect stems 2 to 10 diameter long; leaves linear, flat with oblong ligule. Raceme oval or oblong, lobed, 1 to 9 cm long, with branched axis. Fertile spikelets, with one to two, rarely three, florets, furnished with long awns. Paleae of the sterile spikelets furnished with long awns, silvery. Lower palea of fertile spikelets 5 to 6 mm long, not including the awn, and scabrous above, yellowish green when dry. (A) Central Europe, the Mediterranean region and the Atlantic Islands: naturalised in South America. March-May. *Malta* and *Gozo*; frequent here and there in valleys and on uncultivated and rocky ground, but nowhere common.-*Chrysurus echinatus* Pal. de Beauv. E. Cock's comb grass. I. Covetta, Ventolana.

The form: *purpurascens* Ten., with purplish silvery panicle, is frequent with the typical form at Boschetto, Dingli etc.

### LAMARCKIA Moench.

Panicle spike-like, unilateral. Spikelets fertile or sterile. The fertile consisting of a lower fertile hermaphrodite floret and an upper sterile one on a long



peduncle, both awned. The sterile consisting of 2 glumes and 6 to 9 paleae, the lower palea with two apical teeth and a long awn between them. Includes only one species.

#### LAMARCKIA AUREA (L.

the base, 1 to 2 diameter long. Leaves broad, linear, with wide sheaths and a long ligule. Panicle oblong, elongated, clear golden green or golden yellow, s far as Afghanistan, Abyssinia, the Atlantic Islands, California. March May. *Malta* and there; Valletta and Floriana Glacis, Wied il Ghasel, Musta, St Paul's Bay, Saline, Migiarro, Gneina, Wied Ghomor; very frequent at Blata il Bajda. *Cynosurus aureus* L. *Chrysurus aureus* Spr.

#### SPHENOPUS Trin.

Panicle more or less spreading. Spikelets with 3 or 4 hermaphrodite florets. Glumes very small, unequal, scale like. Lower palea oval-toothed at the apex; upper palea emarginate, with 2 keels. Includes only one

prostrate, 1 to 3 diameter long, with narrow linear leaves, with a lanceolate ligule. Panicle with capillary branches, often purplish. Spikelet on pedicels thickened at the apex. (A) Mediterranean region. March-*Malta*, frequent and often common in places covered with water during winter

Sliema, Marsa, Ta Baldu, Hamrun, Saline St Paul's Bay, Floriana, Corradino, Gozo, less frequent; at Ramla, Marsalforno, Migiarro. *Poa divaricata* Gouan. *P. expansa* Gmel.-*Festuca*

pedicelled. Glumes shorter than the florets, abrupt, the lower smaller than the upper. Lower palea abrupt, eroded at the apex, trigonous and keeled at the ; upper palea emarginate, with 2 keels. Includes only one species.

#### CATABROSA AQUATICA (L.) P.B. Stems ascending and rooting, 2 to 5

pyramidal, with semi- often more or less coloured. Upper glume broad, obovate, with fine teeth at the apex, much shorter than the

Mediterranean region, Siberia, North America. March- *Malta*, very rare; Gneina, Ghain Mula and Ghain Rihana.-*Glyceria aquatica*

Panicle spreading. Spikelets with 3 or many florets, with an axis not jointed. Glumes keeled, shorter than the next floret. Lower palea concave and ventricose, keeled obtuse, with 3 nerves, awnless; the upper with 2 keels, obtuse or emarginate. Includes about 100 species broadly dispersed in warm and temperate regions, two being almost cosmopolitan.

**ERAGROSTIS MEGASTACHYA** Link. Stems caespitose, 1 to 5 diameter long. Leaves linear, acuminate, with glandular tubercles along the margin, and with a tuft of hairs instead of a ligule. Axillary branches leafy. Spikelets at first green and afterwards more or less purplish, much longer than their peduncles. Glumes oval. Lower palea very obtuse, sometimes emarginate or mucronate. Panicle large, oval-oblong, with stiff spreading branches. (A) Almost cosmopolitan. Spring and summer. *Malta*, rare; occasionally met with naturalised in gardens, probably introduced with flower-seeds.-*Poa megastachya* Koel.-*Eragrostis vulgaris* Coss. et Germ. Var. *major* Host. is that usually met with. It has the sheaths glabrous or sub-glabrous, with spikelets bearing 15 to 20 florets, in groups at the tips of the branches-*Briza Eragrostis* L.

#### MELICA L.

Inflorescence a raceme or a panicle, sometimes spike-like. Spikelets swollen, with 1 or 2 hermaphrodite florets, bearded or naked, above which there are 1 or 2 rudimentary florets shaped like an abrupt clavate process. Glumes about of same size, almost entirely covering the florets, awnless, with 3 to 7 nerves. Lower palea concave, awnless, cartilaginous, with 7 nerves; the upper elliptical, with 2 teeth and 2 keels. Includes about 50 species dispersed in subtropical and temperate regions in Europe, Asia, Africa and America.

**MELICA CILIATA** L. Rhizome creeping, more or less stoloniferous. Stems more or less caespitose, 4 to 10 diameter long. Leaves linear, very acuminate, with minutely pubescent blade on the upper surface, partly convolute, rather stiff, with striated glabrous sheaths and with an oblong ligule. Panicle loose, spike-like, with short applied branches, often unilateral and interrupted, sometimes 2 diameter long. Lower palea naked at the back, scabrous and villous at the margin. (P) Europe, Mediterranean region, Siberia, Madeira, Canaries. April-June. In rocky places, along field walls and in valleys in stony localities; *Malta*, Wied il Ghasel, Wied Babu, Wied Encita, Wied Ghomor etc. *Gozo*, at Xlendi, Wied il Lunziata, Imgiar I-Xini etc. *Comino*, in several places. E. Melick-grass.

Var. *glauca* F. Schultz.-*Melica nebrodensis* Gr. et Godr. Panicle slender, unilateral, very loose. Leaves very narrow, entirely convolute. Stems 3 to 6 diameter high. Glumes subequal; the sterile floret dotted and scabrous. *Malta*, *Gozo* and *Comino*, with the typical form.

Var. *Magnolii* Gr. et Godr. Stems up to 1 m high, stiff but slender. Leaves very narrow, at first flat and afterwards convolute. Panicle less loose, much

branched. Sterile florets smooth. With the typical form in *Malta* and *Gozo*, and often replacing it.

MELICA MINUTA L. Rhizome creeping, stems more or less caespitose and clustered, filiform, erect or ascending, 1 to 4 diameter long. Leaves entirely setaceous and convolute, with an oblong laciniate ligule. Panicle unilateral, branched below, or simple. Spikelets swollen, variegated, pendulous, with 3 to 4 florets, of which the upper 1 or 2 are rudimentary. (P) Mediterranean region. March-May. *Malta* and *Gozo*, frequent in rocky places and in valleys, chiefly among clumps of *Erica multiflora*.-*Melica pyramidalis* Lam.-*Melica major* s. et S. (non Parl.)

Var. *arrecta* Kunze.-*Melica minuta* var. *latifolia* cosson.-*M. major* Parl. (non S. et S.). Stems 4 to 8 diameter high. Leaves flat, only convolute at the tip, with a short abrupt ligule having two lateral processes. Panicle always branched below. With the typical form in valleys and on less dry ground.

### BRIZA L.

Inflorescence a panicle. Spikelets pendulous, swollen, with 3 or many florets, distichous-imbricate. Glumes membranous, concave-cordate, subequal to, or shorter than, the lower floret with 3 to 5 nerves, awnless. Lower palea shaped like the glumes; the upper ovoid-elliptical, with 2 teeth and 2 knees. Includes about 10 species natives of Europe, and temperate regions of Asia and Africa, Atlantic Islands, Mascarene Islands and South America.

BRIZA MINOR L. Stems erect, caespitose, 2 to 5 diameter high. Leaves flat, linear, short, rough, very acuminate, with an elongated ligule. Panicle erect, large, bi-trichotomous. Spikelets 4 mm broad and 5 mm long, triangular-cordate, with 5 to 7 florets, variegated green and white, or purplish. (A) Western and Southern Europe, North Africa, Atlantic Islands, Japan; naturalised in North America, South Africa etc. March-May. *Malta*, very rare, at wWed Ghomor and Wied Babu; but often met with naturalised in gardens. E. Pearl-grass. I. Brillantina.

BRIZA MAXIMA L. Stems and leaves u.s. Panicle unilateral, with simple branches, curved at the top. Spikelets oval or oblong, very large, 8 mm broad and 12 mm long, often larger, with 5 to 15 florets. Glumes often flushed purple or spotted purple, glabrous. (A) Mediterranean region, South Africa and the Canary Islands. March-May. *Malta*, *Gozo* and *Comino*, frequent and often common on uncultivated ground, in valleys etc. The form: *pubescens* Nicotra, with pubescent spikelets, is frequent with the type and sometimes replaces it. E. Pearl-grass. I. Sonaglini. M. Bezzulet il kattusa.

### DACTYLIS L.

Panicle unilateral, dense. Spikelets with 3 to 5 hermaphrodite florets. Glumes unequal, inequilateral, keeled, mucronate. Lower palea keeled, 5-nerved, entire or emarginate at the apex, mucronate or with very short awn; the upper bifid and with 2 keels. Includes only one species.

**DACTYLIS GLOMERATA L.** Stems erect, 3 to 10 diameter high, more or less caespitose. Leaves flat or grooved, with compressed sheaths, green, broad, with a long ligule. Panicle lobed, made of dense clusters of spikelets, disposed irregularly, on rather long branches. (P) Europe, the Mediterranean region, Siberia; naturalised in Japan and North America. April-June. *Malta*, *Gozo* and *Comino*; frequent or common in valleys and on rocky and uncultivated ground, along walls of fields etc. E. Cock's foot-grass. I. Mazzolina. M. Dekkuka.

Var. *hispanica* Roth.-*Dactylis glaucescens* W. Plant dwarfer: leaves narrow, more or less glaucous. Panicle dense, often spike-like or head-like, with the lower clusters of spikelets almost sessile. Frequent with the typical form, in more exposed and drier situations.

#### POA L.

Inflorescence a panicle. Spikelets with 3 to 8 hermaphrodite florets on a jointed and hairy axis, covered often with cobwebby hairs, the uppermost floret rudimentary. Lower glume slightly smaller, with 1 or 3 nerves. Lower palea compressed at the sides, keeled, awnless, with about 5 nerves: the upper bilobed and with 2 keels. Caryopsis oblong, with a dot-like basilar hilum. Includes about 80 species, distributed all over the world, mostly in temperate regions.

**POA BULBOSA L.** Plant perennial, very dwarf, broadly caespitose, with stems bulbous at the base. Leaves very narrow, flat, with long ligule. Flowering stems 1 to 4 diameter high. Panicle oval, dense. Spikelets oval, whitish or variegated purple, with 4 to 6 florets, very cobwebby. Lower palea with lateral nerves hardly distinct. In the form: *vivipara* Koel, the florets are often replaced by caducous buds. (P) Europe, temperate Asia, temperate Africa, the Canaries. April-June. In arid rocky places and along roads. *Malta*, frequent and often common, at Boschetto, Ghain il Cbira, Ta Laurenti, Wied il Ghasel, Musta, Ghirghenti, Misrah Suffara, Krendi, Hagiar Kem and Mnaidar, Gneina, Bugibba etc. *Gozo*, Ta Cenc, Xlendi, wied il Lunziata, Marsalforno, Pergla, Rabato, Wied iz-Zejt. *Comino*.

Var. *concinna* Gaud. Plant dwarfer, hardy exceeding 2 cm in height, with flowering stems 1 to 2 diameter high. Leaves setaceous, convolute, always pale green. Spikelets with 6 to 10 florets, villous only at the base. *Malta*, rather rare; with the typical form in arid places between Musta and St Paul "tat-Targia", near Inquisitor's Palace, Ghar il Cbir, and probably elsewhere.

**POA ANNUA L.** Plant annual or biennial, very rarely sub-perennial, 1 to 3 diameter high, more or less caespitose. Leaves linear, flat, flaccid, the upper leaves having a long ligule. Panicle more or less broad, with the lower branches almost smooth, with 4 to 10 spikelets, the branches becoming more

or less reflexed after flowering. Spikelets oval, about 3 mm long, greenish,  
1 or 2 florets being female, the uppermost being wide as long as its pedicel.  
-nerved at the base; anthers 3/5 to 4/5 mm long. (A) or (B)  
-June. and *Comino*  
everywhere. E. Common Meadow-

-*Poa exilis* Murbeck. *P. annua* var. *remotiflora* Hack.

bloom; the upper 1 or 2 florets female, the uppermost not more than  
length of its pedicel. Anthers 2/10 to 3/10 mm long. and *Gozo*  
and there with the typical form.

POA TRIVIALIS L. Plant perennial, caespitose, and stoloniferous, with fibrous  
-lanceolate, always

spreading. Spikelets oval, with 3 to 4 florets, green or variegated, usually

Africa, the Canaries; naturalised in North America. March- *Malta*, here  
at Ghirghenti, Imtahleb, San Martin, Ghajn l'Istas,  
Boschetto etc. , Wied Korrot, Wied il Lunziata. E. Bird-  
meadow-

Var. *silvicola* Guss. Base of stem and stolons with thickened ring like nodes.  
Ligule usually short

-compressed, with 4

Lower palea obtuse or abrupt, and scarious at the apex, with 5 to 7 nerves,

species dispersed mostly in temperate regions, a few being found in the  
tropical zone.

GLYCERIA FLUITANS R. Br. Stems prostrat

12 diameter long. Leaves with lower sheaths compressed, linear-  
5 to 8 mm broad, flat, with a short or lanceolate ligule. Panicle narrow, up to 5  
diameter long, almost unilateral, loose, with branches spreading  
bloom. Spikelets 1 to 3 cm long, with 7 to 12 florets, pale green, cylindrical  
before flowering. Florets lanceolate: lower palea with 7 nerves, 5 to 7 mm  
-acute, upper palea acute and bifid. Styles  
. Caryopsis grooved. (P) Europe, Central and Northern Asia,  
North Africa, North and South America, Tasmania. *Festuca fluitans* L. E.  
Float grass, Manna-

obtuse and crenulate at the apex: upper palea obtuse, with 2 teeth. April  
May. *Malta*  
Ghajn Rihana, Wied Bufula, Imtahleb.

GLYCERIA DISTANS Wahlenb. Stems caespitose, erect or ascending, often kneeled at the base. Leaves narrow, usually flat. Panicle large, with spreading or partly reflexed branches, the lower mostly in semi-whorls of 5, naked at the base. Spikelets oblong, green or streaked violet, with 3 to 6 florets, 2 to 3 mm long; lower glume mostly one-nerved, about half the length of the lower palea, which is indistinctly nerved. Styles short, caducous; caryopsis not grooved. (A), (B) or (P) Europe, Western and Central Asia as far as Japan, North and South Africa; naturalised in North America.-*Poa distans* Jacq.

Var. *Borreri* Bab.-*Festuca Borreri* Bab.-*Glyceria permixta* Guss.-*Atropis Borreri* et A. *permixta* Richter. Panicle with lower branches in clusters of 2 or 3, spreading, or partly erect, unilateral furnished with spikelets almost down to the base. Stem more stiff. April-June. *Malta*, in moist localities: at Wied Gherzuma, Bahria, Imtahleb, Gneina, Ghirghenti, Gnien il Cbir, Marsa.

The typical forms of both this and the preceding species have not been found yet in the Maltese Islands.

## FESTUCA L.

Inflorescence in panicle. Spikelets with 2 or more hermaphrodite florets. Lower glume smaller than the upper, with 1 to 3 nerves. Lower palea lanceolate, hardly keeled, indistinctly nerved, with or without an awn; upper palea with 5 teeth and 2 keels, minutely ciliated along the keels. Caryopsis with a linear hilum. Includes about 60 species, dispersed all over the world, especially in temperate regions.

FESTUCA OVINA L. Stems broadly caespitose, usually densely clustered within the same basal sheath, 5 to 7 diameter high, erect. Cauline leaves, as also the radical, setaceous, conduplicate: sheaths open or more or less closed: ligule abrupt, very short, with 2 round processes at the sides usually well defined. Panicle large, oblong, spreading, with branches mostly solitary. Spikelets with 4 to 7 florets, glabrous, very rarely hairy, green or glaucous. Ovary glabrous. (P) Europe, Central and Northern Asia, North Africa, North America, Australia, New Zealand. The typical form is unknown in the Maltese Islands. E. Sheep's Fescue grass.

Var. *duriuscula* L. Plant stronger and taller. Leaves thicker and more stiff almost smooth, recurved, green. Spikelets with short awns, or rarely awnless. April-May. *Malta*, rare, at Corradino according to Delicata. M. Zwien.

FESTUCA ELATIOR L. Plant caespitose with creeping rhizome, with erect stems 6 to 12 diameter high, sometimes prostrate or ascending, developing outside the lower or basal sheaths. Leaves green or glaucous, convolute in prefoliation, scabrous along the margin, and on the upper surface, flat or convolute. Panicle large oblong-pyramidal, with geminate branches, the shorter with 1 or 2 spikelets, the longer with 5 to 8 spikelets. Spikelets elliptical or oblong, green or streaked purple. (P) Europe, temperate Asia, North Africa; naturalised in North America. March-June. E. Dover gras. I.

Paleo dei prati. M. Zwien. This species is represented here by the following varieties.

Var. pratensis Huds. Rhizome shortly creeping, stems up to 9  
Leaves green, long, flat. Lower palea acute. Sheaths partly open. *Malta*  
very rare, in rocky valleys, at Wied Babu.

Var. arundinacea Schreb. Rhizome creeping and stoloniferous. Leaves  
green or slightly glaucous, flat. Sheaths partly  
smooth in their upper part. Panicle large, broad, open, with geminate  
branches both bearing up to 5 or more spikelets. Plant 6 to 15 diameter high.

-June. and Gozo

The local plants belong to the form: mediterranea Hackel.

### VULPIA Gmel.

Panicle raceme like or more or less spike-  
club-

very unequal, the lower very small and scale like. Lower palea, keeled or not  
keeled, entire or with 2 teeth at the apex, mucronate awned. Stamens 1 to 2.  
Ovary glabrous. Caryopsis linear. Includes about 14 species, natives of  
Africa, Asia, America, Australia.

VULPIA MEMBRANACEA Link. Plant annual; stems erect or ascending 1 to

contracted, spike- lower  
branches each with 2 to 5 spikelets. Spikelets with 4 to 6 florets. Upper

1½ to 3 times as long as the paleae. Stamens 3, included; anthers 1 to 1½  
mm long. (A) Western and Eastern Mediterranean -May.  
, frequent here and there, Corradino, Wied Encita, Zabbar (San  
Leonardo), Ghain Tuffieha, Melleha, Marfa. , Ta Cenc, Kala. *Comino*  
common all over the Island.- *Festuca fascic*  
Forsk.- *Vulpia uniglumis* Dum.

VULPIA MYUROS Gmel. Plant annual. Stems erect or kneeled at the base,

florets. Lower glume usually more or less developed: both glumes setaceous

reduced to one, always included, with an anther ½ mm long. (A) Europe, the  
Mediterranean region as far as the Himalaya South Africa, Abyssinia, Atlantic  
distributed in America and Australia. March- *Festuca Myuros* L.

The type (var. *Pseudo myuros* Rehb.- *myuros* Will.) has  
the stem entirely covered by the sheaths, the uppermost sheath often  
unilaterally, somewhat branched  
and partly pendulous. , rather rare: at Ghirghenti, Ghain il Cbira,  
Boschetto; generally on rocky ground in more or less shaded situations.

Var. *dertonensis* Gola-Bromus *dertonensis* All.-Festuca *sciuroides* roth. *Vulpia sciuroides* Gmel. *V. bromoides* Denn.-Festuca *dertonensis* Asch. et Graeb. Stem naked for a long part below the panicle, which is erect, short, unilateral almost simple. Upper glume twice as long as the lower, and about as long as the florets. Awns about as long as their palea, or slightly longer: spikelets about 1 cm long. In arid and exposed situations. *Malta*, frequent at Verdala Park, Boschetto, Tal Gholja, Hagiar Kim, Wied Babu, Wied iz-Zurriek, Ghirghenti etc. *Gozo*, at Xlendi, Ta Cenc, Munxar.

**VULPIA CILIATA** Link. Stems erect or kneeled, 2 to 3 diameter high. Leaves u.s. Panicle contracted, spike-like, unilateral, often somewhat curved. Spikelets mostly with 6 florets, 6 mm long, not including the awns. Upper glume much shorter than the florets; lower glume scale-like. Awns about as long as the paleae, or rarely 2 or 3 times as long. (A) Western Europe and the Mediterranean region. March-May. *Malta*, *Gozo* and *Comino*, very common in arid and exposed situations.-Festuca *ciliata* Danth-F. *Danthonii* Asch. et Graeb.-*Vulpia Danthonii* Volk.

#### CATAPODIUM Link.

Spike unilateral or distichous, with grooved rachis. Spikelets sessile, pointed towards the apex. Glumes about equal. Lower palea oval, concave, obtuse, always awnless; the upper elliptical, with 2 teeth and 2 keels. Includes 9 species, natives of Western and southern Europe, North and South Africa, the Canaries; one being found in Afghanistan.

**CATAPODIUM SICULUM** (Jacq) Link. Stems erect or ascending, 1 to 5 diameter long. Leaves linear, more or less convolute. Spike unilateral, simple. Spikelets close together, but diverging from the rachis, 3 to 5 mm broad, with about 15 florets. Lower palea smooth, keeled near the apex. Stigmas plumose, much branched. Ovary ovoid-elliptical, glabrous. (A) South Spain, North Africa, Sicily, Sardinia, Calabria. April-May. Here and there in rocky and exposed situations and in sandy situations close to the sea. *Malta*, Melleha, Marsascala, Marfa. *Gozo*, Kala Dueira, Ta Cenc, Wied Bingemma, Ghajnsielem, Marsalforno, Ramla, Kala. *Comino* and *Cominotto*.-Cynosurus *siculus* Jacq.-Triticum *unioloides* Ait.-Desmazeria *sicula* Dum.-Festuca *unioloides* Kunth.

**CATAPODIUM LOLIACEUM** (Huds.) Link. Stems erect-ascending or prostrate, 5 to 15 cm long. Leaves u.s. Spike unilateral, simple or slightly branched at the base. Spikelets applied to the thick deeply grooved rachis, each about 2 mm broad, with 5 to 11 florets. Lower palea obtuse, keeled near the apex. The rest u.s. (A) Western Europe and the Mediterranean region. March-May. *Malta*, *Gozo* and *Comino*; common in arid localities.-Poa *loliacea* Huds.-Triticum *Rottboellia* Lam. et D. C.-Desmazeria *loliacea* Nym.-Festuca *Rottboellia* Asch. et Gr.

#### SCLEROCHLOA Pal. de Beauv.



Panicle unilateral, raceme-like. Spikelets coriaceous, with 3 to 12 florets. Glumes obtuse, unequal. Lower palea oblong, keeled, abrupt, awnless or mucronate; the upper with 2 teeth and 2 keels. Includes 10 species, natives of Central Europe and the Mediterranean region; one being found in South Africa.

**SCLEROILOA RIGIDA** Link. Stems erect or kneeled or prostrate, caespitose or almost solitary, 5 to 60 cm long, smooth. Panicle with short unjointed branches, erect or spreading, furnished with spikelets down to the base, but without a spikelet at the bifurcations. Spikelets with 5 to 11 florets, green, or becoming later as well as the plant itself, purplish red, rarely whitish. Lower palea coriaceous, with indistinct nerves, obtuse at the apex, with emarginate keel. (A) Central Europe and the Mediterranean region. March-May. *Malta*, *Gozo*, *Comino* and *Cominotto*; very common in valleys, fields, gardens, along roads and on uncultivated ground.-*Poa rigida* L.-*Scleropoa rigida* Griseb.

Var. *Hemipoa* Guss.-*Festuca Hemipoa* Del.-*Scleropoa hemipoa* Parl. Stem scabrous above. Panicle with long branches, spreading and naked below. Spikelets more elliptical. Lower palea acute or mucronate, with acute keel. Plant higher and more erect. Common with the species in valleys, fields and gardens.

**SCLEROCHLOA MARITIMA** Sweet. Stems caespitose, diffuse, ascending, often rooting, 1 to 4 diameter long. Panicle oval, with jointed, smooth, very spreading branches, having a triangular section, with a spikelet at the bifurcations. Spikelets broad, compressed, with 5 to 9 florets, on a fragile rachis, 14 to 15 mm long. Lower palea strongly keeled, mucronate, membranous, with a marginal nerve on each side. (A) Mediterranean region. March-May. On sandy beaches. *Malta*, rare, at Melleha; *Gozo*, also rare, at Ramla.-*Triticum maritimum* L.-*Festuca lanceolata* Forsk.-*Cutandia maritima* Benth.

## BROMUS L.

Inflorescence a panicle. Spikelets many-flowered, the upper florets being mostly sterile. Glumes often unequal, shorter than the next floret, keeled or not. Lower palea concave or keeled, awned just below the tip or between 2 teeth or processes, rarely awnless; the upper elliptical-obtuse, ciliated or pubescent on the keel. Stamens 3, rarely 2 or 1. Style inserted on the dorsal side of the ovary, which is villous at the apex. Includes about 40 species, mostly natives of temperate regions in the northern hemisphere and in South America.

**BROMUS TECTORUM** L. Stems erect or kneeled, mostly simple, 1 to 3 diameter high. Leaves and sheaths soft and pubescent, with a short obtuse ligule. Panicle pendulous, almost unilateral, with pubescent or hirsute axis and branches, which are slender, flexuous, and the lower ones with 2 to 6 spikelets. Spikelets hairy, very rarely glabrous, with 5 to 9 florets. Glumes

and paleae broadly scarious at the margin. Awns about as long as their paleae. (A) Europe, the Mediterranean region as far as Arabia and Afghanistan, Siberia, Atlantic Islands; naturalised in North America. March-May. *Malta* and *Gozo*, along contry-roads and on walls of fields.

**BROMUS VILLOSUS** Forsk. Stems erect, often caespitose, hairy above, 2 to 10 diameter high. Leaves linear, flat, more or less hairy along with the sheaths; ligule oblong, laciniate. Panicle erect or inclined, with 1 or 2 spikelets on the branches, the branches and axis being pubescent-hairy. Spikelets 3 to 6 cm long, not including the awns, with 4 to 8 florets, rarely more, green, glabrous or hairy. Lower palea with margin broadly scarious white. (A) Western Europe, Mediterranean region, the Canaries; naturalised in the Mascarene Islands and South Africa. February-May. E. Brome-grass. M. Bunexxief. The following varieties are met with.

Var. *maximus* Desf.-*Bromus ambigens* Jord. (often considered as the typical form of the species). Panicle broad, erect, with branches up to 5 cm long; spikelets with 5 to 7 florets, on peduncles up to 3 cm long. Awn about 1½ times the length of the palea. January-May. *Malta*, *Gozo* and *Comino*; common everywhere.

Var. *Gussonei* Parl. Panicle broad, inclined, with branches up to 10 cm long, the lower ones in clusters of 4 to 6. Spikelets larger, on penuncles 2 to 4 cm long. *Malta*, *Gozo* and *Comino*; frequent with the preceding, especially on good moist soils.

Var. *rigidus* Roth. Panicle smaller, rigidly erect, contracted, with branches up to 3 cm long. Spikelets with 8 to 15 florets, on peduncles up to 5 mm long: awn about as long as the palea, or just longer. *Malta*, *Gozo* and *Comino*, in more exposed and less fertile places.

**BROMUS STERILIS** L. Plant 3 to 6 diameter high. Stems mostly glabrous above, with leaves minutely pubescent, and lower sheaths often villous. Panicle loose, with spreading branches partly as long as the spikelets, each branch with 1 to 4 spikelets, which are on rather long peduncles, with 5 to 11 florets, green, becoming vinous-red at maturity. Lower palea with a narrow scarious margin. Awn mostly straight, about as long as the palea. (A) Europe, the Mediterranean region, Western Siberia, Atlantic Islands; naturalised in North America. February-May.-*Bromus distichus* Moench. The typical form has not been collected in the Maltese Islands. E. Drake, Black-grass. I. Forasacco.

Var. *madritensis* L. Plant 1 to 4 diameter high. Panicle compact, with adpressed branches shorter than the spikelets. Awn usually recurved at maturity. January-May. *Malta*, *Gozo* and *Comino*; very common in fields, in valleys and on uncultivated ground. M. Bunexxief. The form. *Delilei* Boiss., with much smaller compact panicle, usually on solitary stems, is met with here and there in more arid places.

BROMUS RUBES L. Stems erect, mostly solitary, densely hairy above, 1 to 3  
abrupt lancinate ligule. Panicle oval, small, erect, compact. Spikelets on  
more or less flushed red, later on becoming purplish-  
preceding species. Awns about as long as their palea or slightly longer,  
spreading an  
Mesopotamia, Atlantic Islands. February- *Malta* and on stony  
and arid ground. The typical form is far from common; at Boschetto, Ta Bria,

*culatus* Presl.-

Panicle obovate, obconical or wedge- *Malta, Gozo*  
and ; common in many places, but usually in exposed situations and  
on very arid ground.

BROMUS SECALINUS L.

above, 3 to 10 diameter high. Leaves linear, flat, usually with glabrous  
sheaths. Panicle erect or inclined, with slender branches longer than the  
glabrous or hairy.

Florets 2 to 15, with margins of paleae becoming convolute after flowering,

upper, awns straight or flexuous, short or very short. (A) Europe, the  
Mediterranean

America. March- -*Serrafalcus secalinus* Bab. The following variety is

cm in length, with 2 to 7 florets, rarely more: lower palea up to 8 mm long. E.  
-grass, Drake.

BROMUS HORDACEUS L. Stems and leaves u.s. Panicle becoming

spikelets. Spikelets large, swollen, oval lanceolate, greenish or very rarely  
reddish, 20 to 30 mm long, including the short awns with 6 to 12 mm long,

than the upper; awn about as long as the palea. (A) or (B) Europe, the

Islands; naturalised in North and South America. March- -grass,  
-corn. I. Spigolina. M. Hurtan or Hortan.

The following variet

which is spreading when in flower, and then becomes contracted, erect or  
inclined; branches mostly shorter than the spikelets, which are glabrous or  
palea distinctly nerved: awns straight at maturity. *Malta, Gozo*

*and Comino*: common in fields and valleys, in gardens and along roads-*Serrafalcus mollis* Parl. This variety is often considered as the typical form of the species.

Var. *milliformis* Lloyd.-*Serrafalcus Lloydianus* Gr. et Godr.-*Bromus Lloydianus* Nym. Stems u.s. Panicle contracted also when in flower, erect, dense, with short branches. Spikelets hairy or vary rarely glabrous. Awns spreading at maturity. Frequent or common with the preceding, of which it is often considered as a mre form.

Var. *neglectus* Nym.-*Serrafalcus neglectus* Parl.-*S. racemosus* var. *neglectus* Parl. Stems and awns u.s. Panicle loose, spreading, becoming pendulous at maturity. Spikelets pubescent-white. *Malta* and *Gozo*; here and there, in valleys, in fields, and on uncultivated ground; but not frequent.

Var. *racemosus* L.-*Serrafalcus racemosus* Parl. Stems glabrous above: branches of panicle rought or scabrous. Panicle erect, spreading when in flower and afterwards contracted with branches mostly shorter than the spikelets. Spikelets glabrous, 15 to 20 mm long. Lower palea indistinctly nerved. Awns straight. In fields, gardens and in valleys, not frequent. *Malta*, Attard, Boschetto, Wied Encita, Wied il Ghasel, Bieb ir-Rua, C. Luca. *Gozo*, Rabato and il-Lunziata.

**BROMUS SCOPARIUS L.** stems kneeled at the base, hairy above, 1 to 4 diameter high. Leaves and sheaths softly hairy. Panicle oval-obtuse, dense, erect, contracted before and after flowering. Spikelets sessile or subsessile, with 6 to 8 florets, with awns subequal to the palea, contorted spirally. Lower palea much longer than the upper. (A) Mediterranean region and Persia. March-May. *Malta*, rare, Wied Babu, according to *Delicata*.-*Serrafalcus scoparius* Parl.

#### BRACHYPODIUM P.B.

Spike distichous, with flattened axis. Spikelets many-flowered, on short thickened peduncles, with their narrow or lateral side edgeways, towards the axis of the spike. Glumes subequal. Lower palea concave, awned, rarely awnless; the upper entire, with 2 keels, ciliated along the keels. Includes about 5 species, natives of Europe, temperate Asia, tropical and south Africa and central America.

**BRACHYPODIUM DISTACHYUM P.B.** Plant annual, 5 to 30 cm high. Stems erect, smooth, simple or slightly branched. Leaves soft, ciliated, with glabrous or hairy sheaths. Spikelets always compressed at the sides, glabrous, with 6 to 12 florets in a short spikelet; sometimes the spike is reduced to only one spikelet. Awns longer than the florets, rarely very short. (A) South Europe, North and South Africa, Abyssinia, Western Asia as far as Afghanistan, Atlantic Islands. April-June. *Malta*, *Gozo* and *Comino*; very common in exposed weedy localities. In arid localities it has often only one spikelet (form: *monostachyum* Guss.); in better soils it may have 4 or 5 spikelets, sometimes

practically stemless.

Var. *asperum* R. et S. - lets  
glabrous, but with ciliated paleae. Frequent with the typical form.

BRACHYPODIUM SILVATICUM P.B. Plant perennial, deep green, with  
flat, linear- y, as well as the sheaths. Spike  
flexuous, often inclined. Spikelets cylindrical before flowering, 15 to 30 mm

yellow. (P) Europe, the Mediterranean region, Atlantic Islands, Japan. April  
June. *Malta*

in shaded places. *Gozo*

Korrot, Migiarro, Imgiar ix- -*Bromus pinnatus* var. L.

*Festuca silvatica* Huds. E. False Brome grass

BRACHYPODIUM PINNATUM P.B. Plant perennial, light green, with  
creeping rhizome. Stems rigid, not branched at the base, 1 to 3 diameter

curved, usually with many spikelets. Spikelets mostly hairy, 15 to 40 mm

length. (P) Europe, the Mediterranean region, Siberia. April- *Malta*, very

-*Bromus pinnatus* L. *Brachypodium*  
*pinnatum* var. *vulgare* Koch.

Var. *ramosum* R. et S. *Bromus ramosus* L. Stems much branched at the base.  
Spike short, with 1 to 5 spikelets. Leaves short, glaucous, dense, setaceous,  
short awns. South Europe and North  
africa. April June. *Malta, Gozo, Commino Cominotto*; frequent and often

#### -HORDEAE

Spikes mostly distichous, with a grooved axis, with sessile spikelets of one or  
hermaphrodite florets, jointed above the glumes. Glumes 1 or 2, not  
longer than the florets. Lower palea awnless or awned. Stigmas exerted at

one hermaphrodite floret, with or without a rudimentary or sterile floret.

teeth and 2 keels. Includes 6 species natives of Europe, temperate Asia,  
North Africa and Australia.

LEPTURUS INCURVUS Druce. Stems in clusters, often decumbent, 1 to 4  
-cylindrical, stiff and

externally, about twice as long as the floret. Anthers very small, ovl-oblong. (A Central Europe, the Mediterranean region, Atlantic Islands, Australia. March-may. *Malta*, *Gozo Comino* and *Cominotto*: frequent or common on rocky ground and in sandy places, especially not far from the sea.-*Aegilops incurva* L.-Ae. *Incurvata* L.-*Lepturus incurvatus* Trin.-L. inc. var. *curvatissimus* Asch. et Graeb.-*Pholiurus incurvus* Schinz et Thell. E. Sea-side Hard-grass, Snake's tail.

Var. *filiformis* Trin.-*rottboellia filiformis* Roth.-R. *erecta* Savi-*Lepturus incurvatus* v. *vulgatus* Asch. et Graeb.-*Pholiurus filiformis* Schinz et Thell. Spikes very slender, almost straight and erect. Glumes about as long as the floret. Anthers linear. *Malta*, at Marsa, Gzira, Saline and probably elsewhere.

**LEPTURUS CYLINDRICUS** Trin. Stems erect or ascending. Spikes erect, straight. Spikelets with only one glume, except the terminal spikelet which has two. The rest u.s. (A) Mediterranean region, South Africa, Australia. March-May. Here and there in arid and sandy places, especially near the coast. *Malta*, at Wied Encita, Boschetto, Marfa, St Paul's Bay, Wardia etc. *Gozo*, Kala, Wied Bingemma, Migiarr, Imgiar ix-Xini etc.-*Rottboellia cylindrica* W.-R. *subulata* Savi-*Lepturus subulatus* Kunth.

## LOLIUM L.

Spike distichous. Spikelets solitary in grooves on the axis, with 3 or many hermaphrodite florets, more or less applied to the groove edgeways. Glume one, 5-nerved, external, except the terminal spikelet which has 2 glumes. Lower palea 5-nerved, awnless or awned; the upper with 2 teeth and 2 keels. Includes 4 species, natives of Europe, temperate Asia and North Africa; naturalised in many countries.

**LOLIUM TEMULENTUM** L. Plant annual, stems erect, stiff, 3 to 10 diameter high, scabrous or smooth above. Leaves linear, flat. Spike thick, elongated. Spikelets with 5 to 8 florets, swollen and elliptical at maturity, more or less divergent from the rachis. Glume at least twice as long as the florets. Lower palea almost cartilaginous; awn stiff, longer than the palea. (A) Europe, the Mediterranean region, China, Siberia; naturalised elsewhere. April-May. *Malta* and *Gozo*, here and there among growing crops.-L. *temulentum* var. *macrochaeton* R. Br. E. Cheat, Darnel, Ray-grass, Rye-grass. I. Loglio or Gioglio M. Sicrana.

Var. *arvense* With.-*Lolium speciosum* Stev. Florets awnless, or with a weak and flexuous awn, shorter than its palea. Among growing crops and on uncultivated ground, common in *Malta*, *Gozo* and *Comino*.

**LOLIUM PERENNE** L. Plant biennial or perennial, rarely annual. Stems 2 to 10 diameter high, erect or kneeled at the base, smooth above, with clusters of sterile leaves at the base. Leaves u.s., conduplicate in prefoliation. Spikelets with 3 to 12 florets diverging from the rachis when in flower. Glume shorter than the florets, which are lanceolate and generally awnless. Lower palea herbaceous-scarious. (B) or (P) Europe, temeperate Asia, North Africa,

Atlantic Islands; naturalised in many countries. April- *Malta* and ;  
frequent among growing crops  
Rye-

often met with in fields and gardens.

Var. multiflorum Lam.- *m italicum* a. br. Plant perennial, but flowering the first year u.s. Leaves usually shining green, with convolute prefoliation.

usually awned, especially the upper ones. *Malta* at the Marsa, and probably elsewhere, but at any rate not frequent.

Var. Gaudini Parl. *Lolium multiflorum* Gaud. non Lam. Plant annual or biennial, without sterile clusters of leaves at the base. Leaves green or luteous, somewhat shorter than the glumes. Spikelets with 10 to 20 florets, divergent. Florets awned, rarely all awnless. *Malta*, here and there among growing crops. The form: *ramosum* Lam. In

the form: *muticum* Parl. all florets are awnless.

Var. *siculum* Parl. *Lolium multiflorum* var. Guss. Spike dense and short. Lower palea obtuse or abrupt and lacinate, awnless, or very rarely with very short awn the season. Possibly only a form of the preceding.

Var. *rigidum* Gaud. *Lolium strictum* Presl. Plant annual or biennial u.s., 1½ to 5 diameter high. Spike slender, with spikelets 5 to 10 flowered closely applied to the rachis, forming a more or less cylindrical spike. Glumes somewhat shorter than the florets. *Malta*, *Gozo*, *Comino*; very common

*Lolium lepturoides* Boiss. *Rottboellia loliacea* Bory et Chaub. Stems 2 to 3 diameter long, with spike about half as long. Spike with thickened axis, deeply grooved along the spikelets. Glume longer than the florets. , on uncultivated ground at the Marfa, and probably elsewhere.

#### AGROPYRUM Gaertn.

Spike distichous. Spikelets with 5 to 10 florets, the lower two usually male, solitary on the teeth of the main axis, and applied to it edgeways. Glumes 2, coriaceous, oblong lanceolate. Lower palea awnless or acuminate awned; the upper palea ciliated on its two keels. Includes 32 spe

creeping rhizome. Leaves glaucous, convolute and prickly, minutely velvety on the upper surface, with usually glabrous sheaths. Spike long, with elongated internodes, with axis becoming very fragile at maturity. Spikelets

with 5 to 8 florets, 17 to 30 mm long, closely applied edgeways to the rachis. Glumes obscurely keeled, with 9 to 12 nerves. Paleae obtuse, sometimes mucronate. (P) Along the littoral of Europe, Western Asia and North Africa. May-June. *Malta*, on sandy beaches, rare; at Bahar ic-Ciaghak, Ghadira is-safra, Melleha, Marsa-Triticum junceum L.

### TRITICUM (Tourn.) L.

Spike distichous. Spikelets with 2 to 5 florets, the lower florets being hermaphrodite and the upper male or sterile, applied edgeways to the rachis and inserted solitary on each tooth of same. Glumes 2, coriaceous, ventricose, obliquely abrupt, toothed or awned at the apex, with 1 or 2 keels at least on their upper part. Lower palea oval or lanceolate, equilateral, toothed or awned; the upper with 2 teeth and 2 ciliated keels. Includes 4 species, natives of the Mediterranean region.

TRITICUM AESTIVUM L. Stems erect, 4 to 15 diameter high, entirely fistular. Leaves linear-lanceolate, flat, soft, hairy. Spike variable, but always terminating with a well developed spikelet. Spikelets glabrous or pubescent, mostly with 2 to 4 fertile florets. Glumes with obtuse lateral teeth, membranous, stiff, mucronate-awned, shorter than the florets, keeled in their upper part, rounded below. Paleae equal, the upper one separating as a whole. Awns very long. Pollen almost spherical. Caryopsis free. (A) Originally native of Palestine and Persia; extensively cultivated in temperate countries and regions. April-May. *Malta*, *Gozo* and *Comino*; frequently cultivated.-Triticum sativum Lam.-T. vulgare Vill. E. Spring-wheat. I. Grano d'estate, Marzuolo, Civitella. M. Tomnija.

Var. hibernum L. Spike long, rather loose, more or less compressed at the sides, awnless or with very short awns in the upper spikelets. E. Winter wheat. I. Frumento calvo, Tosello, Calbigia. M. Kamh ta bla sifa, Kamh Inglis. *Malta*; occasionally cultivated. March-may.

Var. turgidum L. Stems full, at least in their upper part. Glumes acutely keeled, short. Caryopsis short, thick, gibbous, abrupt at the upper end. Spikes variable, awned or awnless. E. Poulard wheat. I. Grano grozzo. M. Kamh tal Australia. April-May. *Malta*, occasionally cultivated.

Var. durum Desf. Stems full or partly full. Spikes mostly compressed, dense, with long awns often more or less coloured. Caryopsis oblong, or elongated, rather narrow and compressed, more or less pointed, with hard horny fracture. Glumes long, acutely keeled. *Malta*, *Gozo* and *Comino*; very commonly cultivated in various forms. April-May. E. Hard wheat, Macaroni wheat. I. Grano duro. M. Kamh samm, Kamh ta Malta.

Besides the so-called red-wheat commonly grown on reddish soils, and the yellow-wheat, commonly grown on clayey soils, such hard wheats as Medeah (M. Kamh ta Susa), the black-eared wheat (M Kamh ta sifja seuda) etc are also cultivated. Hard wheats thrive better on calcareous soils and in the



warmer regions of the temperate zones than the soft wheats, hence in the warmer Mediterranean countries are generally preferred for cultivation. In such countries the poulard or rivet wheat do well, but the soft wheats soon degenerate, and the grain assumes more or less “durum” qualities, becoming shrivelled and horny.

Var. *polonicum* L. Stem full in its upper part. Spike large, more or less compressed. Glumes papery, keeled, oblong-lanceolate, with 2 teeth, equal to or longer than the florets. Lower floret with the upper palea half the length of the lower. Usually awned. Caryopsis oblong-elongated; more or less like that of Medeah wheat, but of a lighter colour. April-May. E. Poland or Russian or Astrakan wheat. I. Grano di Russia o di Polonia. M. Kamh polakk, Kamh ta sifja uisgha. *Malta*, occasionally cultivated; more as a curiosity. This is a good “durum” wheat for colder temperate countries.

#### AEGILOPS (Dillen) L.

Glumes not keeled, or hardly keeled, with many nerves, hispid or spinescent along the nerves, with one or more unequal teeth, and with 1 to 4 awns, often divergent. The rest as in *Triticum*. Includes 12 species, natives of South Europe, North Africa and Western Asia as far as Afghanistan.

AEGILOPS OVATA L. Plant annual; stem slender, mostly kneeled, 1 to 4 diameter high. Leaves linear, flat, glabrous or hairy. Spike ovate or oblong-oval, short, glaucous, with 3 to 5 spikelets, the upper ones being mostly sterile, oval and swollen. Glumes hispid, with 3 to 4, rarely 5, awns spreading at right angle, about as long as the awns of the paleae. Awns rough along their whole length. Lower palea with 2 or 3 awns, much longer than itself. (A) Mediterranean region, Persia, Canary Islands. March-june. Frequent in valleys and on uncultivated weedy ground. *Malta*, Corradino, Wied Kirda, Marsa, Luca, Wied Encita, Ghirghenti, Boschetto etc. *Gozo*, at Xlendi, Imgiar ix-Xini, Ramla, Nadur, Migiarro. *Comino*, frequent all over the Island. E. Goat-grass.

Var. *biuncialis* Vis.-*Triticum ovatum* v. *biuncialis* Asch. et Graeb. Spikes very short and glaucous, with 2 fertile spikelets and usually only one sterile at the base. Glumes of lower spikelet with 2 awns, those of upper spikelet with 3 awns, longer than the awns of the paleae. *Malta*, here and there with the type, in arid places, at Wied Encita and Boschetto.

Var. *triaristata* W.-*Triticum triaristatum* Gr. et Godr. Spikes green, rather long or oblong, with 4 to 5 fertile spikelets, and 2 or 3 abortive spikelets at the base. Glumes with 2 or 3 awns, more or less erect, smooth at the base. *Malta* and *Gozo*; here and there with the type, especially in moist or shaded places.

#### HORDEUM (Tourn.) L.

Spike distichous; spikelets in clusters of 3, at each tooth of the spike-axis, consisting of 1 floret, and an abortive upper floret. Central spikelet

hermaphrodite and sessile, the lateral ones stipitate, male or neutral, rarely all three hermaphrodite. Each spikelet with 2 anterior glumes, subulate-awned. Lower palea lanceolate-acuminate, not keeled, awned or awnless in the lateral spikelets; upper palea with 2 teeth and 2 keels. Includes 16 species, natives of Europe, North Africa, temperate Asia, North and South America.

**HORDEUM VULGARE L.** Stems erect, caespitose, 8 to 10 diameter high. Leaves linear-lanceolate, more or less flat, with 2 ear-like processes at the top of the sheath. Spike long, more or less quadrangular, two of the 6 rows of spikelets being less prominent than the others. Spikelets all fertile, sessile, and awned. Caryopsis closely covered with the palea. (A) Believed to be native of Western Asia; extensively cultivated in most countries-Hordeum sativum Jessen. March-May. *Malta*, *Gozo* and *Comino*; cultivated. E. Barley. I. Orzo. M. Xgheir.

The form: *coeleste* Viborg, with naked caryopsis (in Maltese-Xgheir Kamhi), and the form: *nigrum* W., with glaucous black chaff and awn, (in Maltese Xgheir issued) in which the black palea adheres to or covers the caryopsis, and occasionally cultivated, but more as a curiosity.

Var. *hexastichum* L. Spike short and thick, distinctly six-angled, with 6 rows or spikelets at equal distances and equally prominent. *Malta* and *Gozo*; occasionally cultivated, (M. Xgheir tal birra or Xgheir tal mazza).

Var. *distichum* L. Spikes long, linear, flat. Middle spikelet fertile, the laterals male or neutral, stipitate and awnless; hence there is only one row of fruits on each side, in the middle spikelets, which have long straight awns. M. Xgheir tal birra. Occasionally cultivated.

**HORDEUM BULBOSUM L.** Plant annual or perennial, more or less caespitose. Stems erect, kneeled and knotty at the base, up to 1 m high. Leaves soft, glabrous, flat. Spike long 8 to 15 cm, compressed. Lateral spikelets sterile; glumes all setaceous-aristate; lower palea awnless. (A) or (P) Mediterranean region. March-May.-Hordeum strictum Desf. *Malta*, rather rare, at Melleha, Ghadira, Selmun, Ghain Znuber and Wied il Ghasel, on rocky wastes or among crops.

**HORDEUM MARINUM Huds.** Plant annual. Stems kneeled, leafy up to the apex, 1 to 3 diameter long. Leaves flat, soft, glabrous. Spike elongated, subcompressed. Glumes scabrous, not ciliated along the margin. Median spikelet with setaceous glumes, the laterals with an outer setaceous glume and an inner one semi-lanceolate. (A) Europe, Western Asia, North africa, Atlantic Islands, America. March-May. In weedy and more or less dry localities. *Malta*, St Paul's Bay, Puales, Ghain Tuffieha, Imtahleb, Bugibba, Marsa, Wied Encita, Ghain Rihana etc. *Gozo*, Ramla, Nadur, San Blas, Dahlet Korrot, Ghainsielem, Wied il Lunziata-Hordeum maritimum With. E. Squirrel-tail grass. I. Orso marino. M. Bunexxief.

Var. *Gussoneanum* Parl. Spike more slender. Spikelets all with setaceous glumes. With the typical form, in *Malta*, at Imtahleb and Bahria, and in *Gozo* at Ghainsielem and Kbaijar.

**HORDEUM MURINUM** L. Plant u.s. Stems erect or decumbent, 2 to 4 diameter long. Leaves u.s. Spike larger, with stiffer awns twice as long as their palea. Glumes partly ciliated along the margin, smooth. Median spikelet with linear-lanceolate glumes, ciliated along the margin: lateral spikelets with the outer glume not ciliated and with the inner glumes ciliated on one side only. All paleae unequal. (A) Europe, Western Asia, North Africa, Atlantic Islands; naturalised in America, Japan, New Zealand etc. March-May. *Malta*, *Gozo* and *Comino*, here and there; the typical form is nowhere common. E. Mouse Barley, Squirrel-tail grass. I. Orzo selvatico, Grano canino. M. Bunexxief.

Var. *Ieporinum* Link.-*Hordeum pseudo-murinum* Tapp. Spike larger than in the type, usually 7 cm long by 2 broad; lateral spikelets with the inner glume ciliated on both sides, and with the palea broader than in the median spikelet. *Malta*, *Gozo* and *Comino*; very common everywhere; usually replacing the typical form in fields, valleys, along roads, on walls etc.

## ORDER SPADICIFLORAE.

### TYPHACEAE.

Perennials, aquatic or living in boggy or moist places, with a creeping rhizomes. Stem cylindrical, solid, simple or branched. Leaves alternate, linear, entire, mostly radical, sheathing. Flowers monoecious, with or without perianth, in dense spikes or heads, continuous or interrupted, furnished with spathes, the upper flowers being male and the lower female. Male flowers with numerous stamens, accompanied with bristles or membraneous scales, with oblong basifixed 2-celled anthers. Female flowers with ovaries also furnished with bristles or scales, with simple style continuous with the ovary, terminating in a long unilateral stigma. Ovary 1 or 2-celled, each cell with one pendulous anatropous ovule. Fruit dry, angular, tipped with the style, with the epicarp split on one side, with coriaceous endocarp; or an indehiscent drupe with spongy epicarp. Seed linear or ovoid, with copious albumen.

The family includes 2 genera, with about 16 species distributed all over the world.

The soft downy material of the female inflorescence of *Typha latifolia* is used as haemostatic and applied to fresh wounds, especially in the case of wounds about the head: the leaves are excellent typing material for grafting and budding, instead of *Raffia*, and are also used for making Russian mats.

### TYPHA (Tourn.) L.

Inflorescence consisting of 2 or 3 dense spikes, superimposed on the same axis, the uppermost consisting of male flowers and the lower one or two of female flowers, with a foliaceous bract at the base of the inflorescence. Perianth replaced by numerous hairs, which are rarely wanting. Male flowers with 2 or 3, rarely 1 to 5, stamens with filaments connate at the base. Female flowers with one-celled ovary, stipitate, the stipes or gynophore being accrescent in the fruit and bears the perianth-hairs: style filiform stigma lateral and spatulate. Fruit an oblong achene. Includes about 10 species, distributed in temperate and warm regions.

**TYPHA ANGUSTIFOLIA L.** Rhizome stoloniferous: stems erect 1 to 2 m high. Leaves longer than the stem, 5-10 mm broad, semi-cylindrical. Female spikes cylindrical, long and slender, usually separated by an interval from each other, becoming-reddish brown at maturity. Female flowers bracteolate, and furnished with hairs which are acute at the tip. Hairs of male flowers flattened or bifid. Stigma much longer than the hairs. Achene grooved longitudinally, with pericarp not adherent to the seed, and finally dehiscent. (P) Europe, Western Asia, Africa, North America, Australia, New Zealand. April-July. *Malta*, rare, at Gneina. E. Small Bul-Rush. I. Stiancia. M. Buda irkika.

Var. *media* Schlecht-Typha elatior Boenningh. Leaves flat, especially in their upper portion. With the typical form in the Gneina valley.

**TYPHA LATIFOLIA L.** Rhizome u.s. Stem u.s. longer. Leaves longer and 1-2 cm broad. Female spikes, cylindrical and thicker, usually continuous or rarely separated by a short interval, becoming dark reddish brown at maturity. Female flowers not bracteolate. Perianth-hairs u.s. Stigma just longer than the perianth hairs, spatulate-oval. Pollen grains grouped in fours. The rest u.s. (P) Europe, Mediterranean region as far as Central Asia and Siberia, Abyssinia, North America, New Zealand. April-July. *Malta*, rare, Gneina, Fiddien, Ta Balbu, Ghain il Cbira, Marsa. The plants growing in the public gardens have been brought originally from Gneina.-Typha spathulaefolia Kronf.-T. minor Curt E. Bel-Rush. Reed-Mace, Cat's tail, Water-Mace, I. Stiancia, Bido, Mazza sorda, Sala. M. Buda.

### SPARGANIUM (Tourn.) L.

Inflorescence in globose heads, of which the upper consist of male flowers, and the lower of female flowers, each flower having a bracteole, like a scale. Perianth made of 3 to 6 scales. Male flowers with 3 or more free stamens, with pollen grains always free. Female flowers with one or two-celled ovary, terminating in one or two linear subsessile stigmas. The fruit is a small drupe with spongy epicarp. Includes about 6 species, natives of temperate and cold regions in the northern hemisphere and in Australia.

**SPARGANIUM ERECTUM L.** Rhizome creeping, plant erect, not floating: leaves linear, coriaceous, keeled on the lower part, about as long as or longer than the stem, which is erect, usually branched above, 6-8 diameter high.

Inflorescence in panicle, with branches bearing several heads. Perianth scales of female flowers lanceolate, brown at the margin. Fruit angular, narrow at the base, broad at the top. (P) In ponds and pools with stagnant or slowly running water, in temperate regions of the northern hemisphere. April-July. *Malta*, very rare, only known to exist in pools along the Ghirghenti valley-Sparganium ramosum Huds-S. polyhedrum Asch. et Gr. e. Bur-reed. I. Bido, Coltellaccio.

## PALMAE.

Perennial woody plants, with a stem, simple or very rarely branched, or with an underground branched rhizome, or with a short creeping stem. Leaves usually large, without stipules, alternate, marcescent, with their base sheathing the stem wholly or partly, with a pinnatisect or flabellate limb. Inflorescence axillary, with a spathe made of one or more bracts or valves. Flowers small, dioecious or monoecious, less often hermaphrodite, sessile or pedicelled, on a simple or branched spadix; each flower usually furnished with a bract and 2 opposite bracteoles, free or coherent, sometimes much reduced or wanting. Perianth double, persistent, coriaceous; calyx of 3 sepals distinct or partly connate; corolla of 3 petals, calycoid, more or less distinct. Stamens hypogynous or perigynous, at the base of the perianth, usually 6 in 2 series, rarely 3 or a larger multiple of 3, with free or united filaments: anthers linear, 2-celled, dorsifixed, usually introrse. Carpels 3, rarely reduced to 2 or 1, distinct or coherent, forming a trilobed ovary, with 1 to 3 cells, of which 2 are usually abortive; styles continuous with the back of the carpels, usually coherent, each with a simple stigma. Ovules usually solitary. Fruit a berry or drupe, with smooth or scaly epicarp, with a fleshy or fibrous mesocarp, and a membraneous, fibrous or bony endocarp. Seed oblong, ovoid or spherical, with a copious albumen.

The Palmae include about 130 genera, with about 1200 species, natives of tropical and subtropical regions, a few being found in the warmer temperate countries.

The Palms have been rightly described by Linnaeus as the Princes of the Vegetable Kingdom, and the noble and elegant habit of most species give them a highly ornamental character. The Date-palm (*Phoenix dactylifera*) furnishes the well known dates of commerce, of which there are countless varieties. Some sorts must be consumed fresh; others on ripening become very sugary and luscious but keep well, and these are the exportable or commercial varieties, among which the Deglet-Noor is the universally known and appreciated sort of the Tunisian and Algerian Oases, where there are also other sorts of equal value. Many sorts become dry on ripening and furnish a sort of sugary meal which is made into cakes and is largely consumed by the natives in Northern Africa and Mesopotamia. The commercial dates require a dry and warm autumn to ripen properly, and that is the reason why they rarely ripen sufficiently in the Maltese Islands. The Coco-nut (*Cocos nucifera*) is well known within the tropics and is a plant of great economic value, all parts being variously utilised as copra, fibre etc. The drupes of *Elaeis guineensis* of West Africa, contain much oil, the well

known palm-oil, used extensively for the manufacture of soap and of margarine. The leaves of *Chamaerops humilis* and of other palms are used for the production of vegetable-fibre for mattresses. The slender stems of *Chamaedorea*, *Calamus*, *Daemonorops* etc are used for walking sticks etc. The bony white seeds of *Phytelephas macrocarpa*, called vegetable ivory, are used for the manufacture of buttons etc. Many species of palms are cultivated for ornament in our gardens, (see Lecture "On Palms," by the writer, published by the Malta Horticulture Society).

#### PHOENIX L.

Flowers dioecious, sessile on the branches of the spadix, which are 20 to 40 cm long, flexuous, surrounded by a large spathe. Male flowers with outer cup-like perianth, 3-toothed, and inner perianth made of 3 segments: stamens 3 to 6, subsessile. Female flowers with perianth u.s. and with 3 distinct ovaries, each with a hooked sessile stigma. Drupe elliptical or oblong, one-seeded. Seed with horny albumen, with agroove-like ventral hilum, and a dorsal navel in the middle of the seed, corresponding to the embryo. Leaves pinnatisect, with the lower segments more or less short, stiff and spiny. Includes 12 species, natives of tropical and subtropical regions in Asia and Africa.

PHOENIX DACTYLIFERA L. Stem erect, 2 to 4 in diameter and 6 to 20 m high, usually with offshoots at the base, especially when young, and with a terminal cluster of very long, glaucescent leaves, coriaceous, with linear-lanceolate, acuminate segments. Drupe 3 to 7 cm long; seed oblong-lanceolate, acute at one or both ends, 2 to 3½cm long. (P) Native of the Sahara and Arabia. April-May. *Malta*, *Gozo* and *Comino*; cultivated for ornament, and frequently met with self-sown, rarely from seed maturing in the Islands, usually from seeds thrown away by those who eat the imported fruit. When properly fertilised, the seed is of good germinating power, but for reasons of climate the fruit rarely matures sufficiently to be eatable. E. Date-palm. I. Palma da datteri. M. Palma, Palma tat-tamar.

#### CHAMAEROPS L.

Flowers male and hermaphrodite in the same plant or in separate plants. Spadix branched like a panicle, with 2 to 4 spathes of which the inner is entire and closed. Outer perianth 3-cleft; inner perianth made of three segments almost free. Male flowers with 6 stamens, with filaments monodelphous at the base. Hermaphrodite flowers with 6 stamens, and usually with 3 ovaries which are free, each with a sessile awl-shaped stigma. Drupes 3 or less by abortion, elliptical, one-seeded. Seed with horny albumen, with a dot-like hilum. Includes only one species and many varieties.

CHAMAEROPS HUMILIS L. Stem covered with scars or with the fibrous base of leaf-petioles. Leaves palmatopartite, fan-like, with 10 to 15 linear-lanceolate segments, with a long petiole furnished with spines. Spathes oval or oblong-spathulate. Drupes yellowish red, globose or elliptical, up to 15 mm in diameter. (P) South Europe and North Africa. April-May. *Malta*, cultivated

for ornament, in several varieties. Formerly a true native. A specimen in the Botanic Gardens and another in San Antonio Gardens were brought from iz-Zenka, a branch of Wied il Ghasel; they are both male plants and are the last known remains of this native palm. E. Dwarf Fan-Palm. I. Palma nana, Cefaglioni. M. Giummar.

The local plants belong to the var. *elegans* Hort.

## ARACEAE.

Perennial herbaceous plants, sometimes caulescent, sarmentose or arborescent, often stemless, and then with a rhizome or tubers. Leaves simple, alternate, glabrous, often large, palmate, pedate, or peltate-nerved, cordate, hastate or peltate, entire or lobed, sometimes perforated, convolute in veneration. Spathe monophyllous, deciduous or persistent. Inflorescence a typical spadix, simple, sessile or stipitate, entirely floriferous, or terminating in a sterile appendix. Flowers sessile, rarely hermaphrodite: the female flowers usually below, the male flowers above, continuous or interrupted, often with sterile or imperfect male flowers at the top. Perianth usually wanting; present only in hermaphrodite flowers. Stamens many, free or coherent, on short filaments or with sessile anthers. Anthers extrorse 2-celled. Ovaries usually clustered, one-celled or plurilocular: style simple or wanting; stigma capitate or discoid, very rarely lobed. Ovules solitary or several. Fruit an indehiscent berry, with one or more cells, each with one or several seeds. Seeds subglobose or angular, usually with a copious albumen.

The Araceae include about 100 genera with over 900 species, most of which are natives of tropical regions and the rest of temperate regions, in both hemispheres.

The Araceae are remarkable for the number of raphides or crystals in their tissues. The spadix of several species gives off heat when in flower, from 4°C in *Arum maculatum* to as much as 10°C in *Colocasia*. Most Araceae contain an acrid juice, which is sometimes highly irritating and poisonous. Thus the leaves of *Colocasia* and *Arum* are very irritating, but this quality disappears when the plant is dried or cooked. *Calla palustris* is a powerful diaphoretic. The rhizome of *Colocasia antiquorum* and other species is very starchy, and when deprived of its acidity by drying or cooking, becomes a wholesome food. *Alocasia macrorrhiza* and *Caladium esculentum*, the Taro, are largely cultivated in the tropics for their edible rhizomes. The fleshy perfumed spadix of *Monstera deliciosa*, which ripens well in these Islands, is frequently used as dessert fruit in Mexico, its country of origin. *Acorus Calamus* has an aromatic and bitter rhizome used as tonic and excitant; it contains the glucoside acorine and a small quantity of the alkaloid calamine.

## TRIBE I-COLOCASIEAE.

Flowers monoecious, without perianth. Stamens connate, forming a pyramidal structure. Spadix often with a sterile appendix.

## COLOCASIA Schott.

Spathe convolute, with a tube much shorter than the limb which is concave-lanceolate. Spadix erect and thick: lower flowers female with one-celled ovary having numerous ovules: middle flowers imperfect male or sterile: upper flowers perfect male with 3 to 5 cobering stamens; the spadix terminating in a naked appendix becoming slender towards the tip. Berry oblong, green, with several seeds. Includes 5 species, natives of tropical Asia, one of which is cultivated or naturalised in many subtropical countries.

COLOCASIA ANTIQUORUM Schott. Rhizome thick, sub-tuberous. Leaves peltate-ovate, large, somewhat cordiform or bilobed at the base, furnished with a long petiole. Stem much shorter than the petiole. Spathe about 30 cm long, pale yellow, greenish at the base; spadix yellowish, much shorter than the spathe. (P) Native of the East Indies and the Islands of Polynesia; cultivated and naturalised elsewhere. April-June. *Malta*, rare, at Bahria, Imtahleb, San Martin and Boschetto; frequently cultivated for ornament in ponds or in moist and shaded places-Arum Colocasia L. E. Cocoa-root, Coco. I. Colocasia, Aro di Egitto. M. Ghorghas.

## TIBE II-ARINEAE.

Flowers monoecious, without perianth. Stamens free. Spadix often with a sterile appendix.

## ARUM (Tourn.) L.

Spathe large, convolute and tubular at the base, with an ovate, concave limb, more or less acuminate, 2 to 4 times as long as the tube. Spadix erect and thick: lower flowers female u.s.; above them there is usually a ring of imperfect male flowers (pistillidia): then there are the male flowers and above these a ring of imperfect male flowers (staminodes), the spadix finishing in a very long naked appendix, clavate or cylindrical. Berries oval-globose, red at maturity, with 1 to 5 seeds. Includes about 15 species, natives of Central Europe, and the Mediterranean region as far as Afghanistan.

ARUM MACULATUM L. Rhizome tuberous, roundish. Leaves more or less sagittate-hastate, developing after the first rains, green, usually with black spots, with petioles twice as long as the blade, which is 7 to 15 cm long. Scape as long as the petiole, or shorter. Spathe yellowish-green with violet blotches, not persistent. Spadix to  $\frac{1}{2}$  the length of the spathe, with a ring of pistillidia, and with the appendix clavate, violet, or yellow flushed violet. (P) Central Europe, the Mediterranean region, the Canaries, Madeira. March-May. *Malta*, the typical form has been doubtfully collected from Wied Babu, gardens at Lia and Balzan and Wied il ghasel. E. Common Arum. I. Gigaro, Giaro. M. Garni.

Var. italicum Mill. Leaves green, or veined white, very rarely spotted black. Spathe greenish white, flushed or blotched violet internally. Spadix with a clavate-cylindrical appendix, yellow or yellowish. *Malta*, Gozo and Comino,



common in valleys and ravines, along field-walls and country roads. A beautiful form with large leaves broadly veined yellowish white (f. *formosum mihi*) is common on clayey ground along the roads Migiarrro-Victoria-Marsalforno, in Gozo, as well as at Wied Gherzuma and Bahria, in *Malta*.

#### DRACUNCULUS (Tourn.) Adans.

Leaves deeply pedate-parted. Spathe very large, 25-40 cm long. Spadix with a very long, deep violet appendix; with the female and male flowers continuous or interrupted. The flowers have usually a strong cadaveric odour. The rest as in Arum. Includes 3 species, natives of South Europe and the Canary Islands.

DRACUNCULUS VULGARIS Schott. Rhizome tuberous, roundish. Leaves generally spotted and blotched white, with long sheaths similarly blotched sheathing the scape almost entirely: blade pedate-parted, with the median lobe broader and entire, and the two lateral with 4 to 7 lobes, lanceolate, the outer being gradually smaller and all turned upwards. Spathe pale green on the outside, purple and glabrous internally, with a wavy and crisped margin, with a cadaveric smell, especially strong when in full sunshine. Spadix about as long as the spathe, with contiguous female and male flowers, and with a very long, purple, smooth, clavate-elongated appendix. Ripe berries red, with 1 to 5 seeds. (P) South Europe and Asia Minor. April-May. In sunny as well as in shaded localities. *Malta*, very rare, Wied iz-Zurriek, Attard, Wied ta Hal-Lia; frequently cultivated as a curiosity.-Arum *Dracunculus* L.-*Dracunculus* *Dracunculus* Voss. E. Dragon-Arum. I. *Serpentaria*, *Dragontea*. M. *Garni koxret is-serp*.

#### ARISARUM Adans.

Spathe tubular with the limb hooded. Appendix of spadix curved and slender. Berries green, with about 6 seeds. The rest as in Arum. Includes 3 species, natives of the Mediterranean region.

ARISARUM VULGARE Targ.-Tozz. Rhizome round or oval. Leaves cordate-hastate, green, without spots: petioles subequal to the scape, spotted with purple. Scape 15-30 cm long, spotted with purple; spathe 3-5 cm long, with cylindrical tube lined white and reddish, limb purplish shortly mucronate at the apex. Spadix shortly exerted with purplish-black appendix, sub-cylindrical or slightly clavate. (P) Mediterranean region, the Canaries. *Malta*, *Gozo* and *Comino*, very common everywhere, often covering the ground for considerable tracts.-Arum *Arisarum* L. E. Friar's cowl Arum. I. *Arisaro*, *Gilico*. M. *Garni tal pipi*.

The form: *Clusii* Schott with the appendix distinctly club-shaped at the tip, is met with along with the typical form. The leaves of *Arisarum vulgare* sometimes have large round yellow spots due to the parasitical alga *Phyllosiphon Arisari*.

RICHARDIA AETHIOPICA Schott.- *R. africana* Kunth.-*Calla aethiopica* Hort., native of South Africa, is very commonly cultivated for ornament and is frequently met with self-sown and half-naturalised in gardens. M. Cella, Bukari.

COLOCASIA ESCULENTA Schott.-*Caladium esculentum* Vent., a native of the tropics, where it is largely cultivated as food under the name of Taro, is commonly cultivated in country-yards for its ornamental foliage, but rarely produces flowers or seeds. M. Ghorghas.

#### LEMNACEAE.

Very small, stemless floating herbs, reduced to lenticular or obovate disks or fronds, emitting by two lateral slits, or only by one slit, young fronds similar to the first; usually with rootlets from the middle of the lower surface. The inflorescence is embedded in the frond. Flowers without perianth, or with a spathe, reduced to 1 or 2 stamens on short filiform filaments, and a sessile pistil. Ovary one-celled, with one or many ovules. Seed albuminous.

They have no economic uses.

The family, a typical example of degeneracy or regressive organization, includes 2 genera with about 20 species inhabiting fresh-water ponds or stagnant waters in temperate and tropical regions.

#### LEMNA L.

Flowers monoecious, arising from a marginal slit of the frond, with a bivalved spathe. Male flowers 2, each with one stamen; anthers 2-celled, each cell with 2 loculi. Female flower solitary: ovary with 1 to 6 ovules, within the same spathe as the male flowers. Flowers are rarely produced, the plants multiplying rapidly by the formation of lateral buds u.s., or by wintering buds or bulbils. Includes 7 species, natives of temperate and tropical regions.

LEMNA MINOR L. Fronds round or roundish, flat on both surfaces; ovary one-ovuled. Anthers dehiscing transversely. Frond always floating, entire, 3-6 mm in diameter. (P) Temperate and tropical regions. April-May. *Malta*, at the Marsa according to Delicata; has recently re-established itself at Ghirghenti. E. Duck-weed. I. Lenticchia d'acqua.

### ORDER GYNANDRAE.

#### ORCHIDACEAE.

Perennial herbs, terrestrial or epiphytes, with a creeping rhizome, or with fascicled roots accompanied by tubercles, or caulescent, or stemless. Leaves simple and usually entire, often connate and swollen at the base forming along

with the thickened stem a swollen organ called pseudo-bulb. Stem or scape usually simple, often branched, naked or scaly. Flowers sygomorphic, hermaphrodite or unisexual by arrest, solitary or in various inflorescences. Perianth superior, usually peraloid, inserted on a naked disk, consisting of 6 segments in 2 series, free or coherent; of the outer 3 segments or sepals 2 are lateral and 1 inferior, becoming superior by the torsion of the pedicel or ovary; of the 3 inner segments or petals, alternating with the sepals, 2 are lateral and similar, and the third called labellum or lip, originally superior and becoming inferior by torsion of the ovary or pedicel, is dissimilar, larger, variously formed, often prolonged at the base into a hollow spur or sac. The limb of the labellum is usually trilobed. Androecium and style fused together into a columb or gynostegium, of which the anterior face terminated by the stigma, opposite the labellum, belongs to the style, and the other side terminated by the anthers is part of the androecium. Stamens usually one, opposite to the superior sepal, accompanied by two rudimentary stamens reduced to prominences: exceptionally there are two perfect lateral stamens. Anther 1 to 4-celled; pollen agglomerated into 2, 4 or 8 mases or pollinia, cohering in mases by means of elastic filaments: pollinia sometimes free, but usually fixed directly or by means of a caudicle to a viscid gland or retinaculum below the anther. Ovary inferior, one-celled, sometimes 3-celled, made of 3 united carpels, with parietal placentation. Style coherent with the stamens, opposite the labellum terminating into a prominence or beak called rostellum, with a stigmatic surface: ovules numerous, anatropous. Fruit a membranous or coriaceous capsule, more or less elongated, one-celled, with various dehiscence. Seeds very numerous and very minute. Embryo rudimentary, fleshy, exalbuminous.

This large family includes about 336 genera, with over 5000 species, mostly natives of tropical and sub-tropical countries; less frequent in temperate countries; a few being found in cold mountainous regions.

*Vanilla planifolia*, and other species of *Vanilla*, natives of the tropics, furnish the well known *Vanilla* pods of commerce, used as flavouring ingredient and sometimes as tonic, carminative and aphrodisiac. The tuberous roots of various species of *Orchis* and *Ophrys* furnish the very nourishing food known as salep. Many Orchids are cultivated for their very remarkable flowers. They are now considered as the most highly organized or evolved of monocotyledonous plants, and are therefore placed at the head of the Vegetable Kingdom in current schemes of classification. Only 2 tribes of Orchids are represented in our Flora.

#### TRIBE I-NEOTTIEAE.

Leaves convolute in prefoliation. Flowers sessile in spike, or pedicelled in erect raceme. Anther solitary, terminal, free or more frequently partly adnate to the base of the gynostegium. Pollinia 2, granular or powdery, without caudicle, with or without gland.

#### SPIRANTHES Rich.

Perianth almost at right angle to the ovary; outer lateral segments spreading, the others connivent. Labellum grooved, entire, with the apex toothed and reflexed. Gynostegium with bifid rostellum. Pollinia bilobed, fixed to only one gland. Ovary hardly or very slightly twisted. Includes about 80 species, natives of tropical and temperate regions.

**SPIRANTHES SPIRALIS** Koch. Roots with two, rarely more, tubers, which are thick, elongated. Leaves ovate or oblong, developing after the flowers, at the side of the scape, and forming a rosette. Scape 1 to 2 diameter high, furnished with only bract-like sheaths, terminating in a long spiral spike of small, white, sessile flowers, sweet-scented. Spike hairy and glandular, with bracts subequal to the ovaries. Labellum obovate. (P) Central Europe and the Mediterranean region. September-November; the scape developing soon after the slightest autumnal shower. *Malta*, here and there; frequent and often common in the Verdala Park and Boschetto; less frequent elsewhere, as at Wied Encita, Hauli, Saline, Bugibba, Pualet etc. Gozo, at Wied il Lunziata.-*Ophrys spiralis* L. p. parte-*Neottia autumnalis* Pers.-*Spiranthes autumnalis* Rich. E. Lady's tresses. M. Haija u mejta, or Bajdiet il fenech, a name common to all our terrestrial Orchids.

#### TRIBE II-OPHRYDEAE.

Flowers sessile in a bracteate spike. Median anther fertile, and entirely adnate to the gynostegium; the two lateral anthers wanting or reduced to a tubercle or staminode likewise adnate to the gynostegium. Pollinia 2, granular, each furnished with a caudicle, rarely sessile, inserted on one or two retinacula or glands.

#### OPHRYS L.

Tubers entire; leaves oblong-lanceolate. Perianth with spreading segments, the inner two smaller. Labellum not spurred, hairy, velvety, with the median lobe much more developed than the laterals, which are often wanting. Gynostegium short, often terminating in a beak. Pollinia each furnished with a caudicle, with a gland and a pit. Ovary not twisted. Includes about 30 species, natives of Europe and the Mediterranean region.

**OPHRYS ARANIFERA** Huds. Scape 5 to 20 cm high, with few flowers, rarely more than 5, with bracts longer than the flowers. Outer segments oval-oblong, yellowish green, subequal to the labellum. The two inner segments lanceolate-linear, crisped or wavy along the margin, glabrous or slightly pubescent, shorter than the outer. Labellum usually without an appendix in the apical notch when this notch is present, velvety, usually with 2 small gibbositities at the base. Labellum oblong-obovate, purplish-black in the centre, yellow or greenish along the margin, with 2 longitudinal glabrous and lucid lines, grey or bluish, with a transverse line in the form of H, sometimes with a smaller transverse line in front. (P) Central Europe and the Mediterranean region. March-April. *Malta*, frequent or common in the Verdala Park and Boschetto, as well as at Ta Laurenti; less frequent or rare

elsewhere, as at Wied Babu, Wied Mokbel, Wied Ghomor, Wied Encita, Puales, Melleha, Wied il Ghasfruia, Wied iz-Zurriek etc. Gozo, Ta Cenc and between Wied Bingemma and Dahliet Korrot, but much less frequent than in *Malta*. E. Spider Orchid. I. Fior ragno. M. Brimba seuda-Ophrys insectifera var. d. L.-Arachnites fuciflora Tod.

Then form: Pseudo-speculum D.C. with slightly developed gibbosities at the base of the labellum, is occasionally met with at Boschetto, along with other forms having glabrous dots instead of lines; rarely with neither lines nor dots.

Var. *lanulata* Parl. Labellum sub-trilobed, with small teeth along the margin, without gibbosities at the base, notched at the apex with a short appendix or tooth in the notch, and with a glabrous crescent-like spot in the middle, with the concavity of the crescent towards the apex. *Malta*, with the species, but rare, at Verdala Park, Boschetto and Wied Encita.

Var. *fucifera* Curt.-Arachnites fuciflora Tod. Labellum entire or trilobed with 2 prominent gibbosities at the base, intensely hairy or villous, dark-brown in the middle, with glabrous lines as in the typical form, with a glabrous margin. *Malta*, with the species at Wied Encita and Boschetto, and probably elsewhere, but much less frequent. The form: *P viridiflora* Barla, with a yellowish-green labellum, brownish along the margin, has been collected in the Verdala Park.

Var. *atrata* Lindl. non L. Labellum as in the preceding variety, densely villous, violet-black, with 2 or 4 glabrous bluish lucid lines, with or without transverse line at the base. *Malta*, rare, at Wied Encita, Verdala Park and Ta Laurenti.

OPHRYS BOMBYLIFLORA Lk. Leaves shorter and broader, of a greyish green. Scape 4 to 15 cm high. Spike with 1 to 4 flowers, rarely more. Bracts shorter than the ovary. Outer segments of perianth pale green, spreading, longer than the labellum, the 2 laterals ovate or roundish, the middle one oblong. The two inner segments very short, oblong, green and glabrous at the apex, purplish and hairy at the base, the middle lobe more or less orbicular, convex trilobed, with the lobes and margin revolute, glabrous and green, in the centre hairy, purplish-brown with one or two glabrous lines and with an obtuse bearded appendix at the apex. Gynostegium without beak. (P) South Europe, North Africa, the Canaries. March-April. *Malta*, *Gozo* and *Comino*, frequent and often common, and forming large patches on rocky and uncultivated ground and in valleys; especially common at Wied Encita, Boschetto, rocky ground from Mistra ta Ghain Tuffieha, in *Malta*; and at Ta Cenc in *Gozo*-*Ophrys bombylifera* W.-Arachnites bombyliflora Tod. E. Bumblebee-Orchis. M. Brimba griza.

OPHRYS APIFERA Huds. Leaves oblong-lanceolate, obtuse, greyish green, more or less grooved. Scape 15 to 30 cm high, with 5 to 9 flowers, and bracts longer than the ovaries. Outer segments of perianth ovate-oblong, subequal to the labellum, rosy or rosy-white, with green keel. The two inner segments cordate, very short, green or flushed purple. Labellum roundish, obovate with 2 gibbosities at the base, convex, semi-globose, with revolute margin, with

acute lateral lobes and the middle lobe roundish, emarginate, velvety, of a purplish-brown colour, having in the middle one or two bluish spots margined yellow the margin of the labellum being glabrous and yellowish or green. Gynostegium with 2 long flexuous beak. (P) Central and Southern Europe and North Africa. April-May. *Malta*, rare, at Fiddien, Intahleb, Wied ir-Rumi, Cottonera, Ghasfurja, Wied Gherzuma, Boschetto (Wied il Luk). This is our finest Orchid.-*Arachnites apifera* Tod.-*Ophrys pseudo-apifera* Caldesi. E. Bee-flower, Bee-Orchid. M. In-Nahla.

OPHRYS BERTOLONII Moretti. Leaves oblong-lanceolate, rather short, green, more or less grooved. Scape 6 to 20 cm high, with 2 to 6 flowers. Outer segments of perianth white or rosy-white or rosy, ovate-oblong, shorter than the labellum. The two inner segments lightly shorter than the outer, linear, not cordate at the base, flushed purple, ciliate only along the margin. Labellum without gibbositities at the base, oblong or obovate, saddle-shaped, entire or trilobed, with revolute margins, velvety, violet-black, with a large glabrous shining spot in the middle, of a lighter colour and of a more or less quadrangular shape. Notch with glabrous appendix, Gynostegium with a short beak. (P) South France, the Balearic Islands, Italy, Sicily, Corsica, Dalmatia, Serbia and Montenegro. March-April. *Malta*, very rare; at Marsascala, Saline, and Misrah Ghonok near Wied il Ghasel.-*Ophrys Speculum Bert non L.*-*Arachnites Bertolonii* Tod.

OPHRYS ARACHNITES Reichard. Leaves narrow, grooved, oblong-lanceolate, green or greyish-green. Scape 5 to 20 cm high, with 2 to 6 flowers. Outer segments of perianth rosy-white or rarely greenish white, subequal to the labellum. The 2 inner segments very short, cordate at the base, u.s. Labellum entire or almost entire, oblong or obovate, convex, with flat margin, purplish-brown, velvety, more or less of a convex-square shape, with a glabrous, shining, dark violet spot in the middle, shaped like an H, surrounded with various glabrous symmetrical lines, margined yellow, and variously reticulate, usually with 2 conical gibbositities more or less marked at the base, with a terminal glabrous, greenish, toothed appendix at the apex. Gynostegium furnished with a small acute beak. (P) Central and Western Europe and the Mediterranean region. March-May. *Malta*, rare; on the rocky and uncultivated ground of Fakkania, between Boschetto and the sea.-*Ophrys insectifera* var. *Arachnites* L.-*Orchis fuciflora* Crantz.-*Arachnites fuciflora* Schm.-*Ophrys fuciflora* Moench.

Var. *oxyrhynchus* Tod. Plant usually more robust. Labellum without gibbositities at the base: flowers larger with more flat margin. The rest u.s. *Malta*, with the typical form at Fakkania, but rarer. E. Late Spider Orchis.

OPHRYS ROSEA Grande. Plant robust u.s.; scape 10 to 25 cm high, with 3 to 7 flowers. Outer segments of perianth, longer or shorter than the labellum, oval-oblong, lively rose or rosy-white. The two inner segments oval and very short. Labellum obovate, emarginate or almost bilobed, cuneate and entire near the base, with almost flat margins, with two indistinct gibbositities at the base, densely pubescent, with a tuft of hairs at the notch, where there is an entire glabrous appendix. Colour of labellum greenish or yellowish, with a

large rhomboid or square spot in the middle, glabrous, dark-purple or violet, often margined yellow. Gynostegium obtuse, without beak. (P) Mediterranean region. March-April. *Malta*, very rare, only collected by Delicata at Wied Babu.-*Ophrys insectifera* var. *rosea* Desf.-*O.tenthredinifera* W.-O. *villosa* Desf.

OPHRYS LUTEA Cav. Leaves oblong-acute, more or less flat. Scape 1 to 2 diameter high, with 2 to 5 flowers. Outer segments of perianth oval-elliptical, shorter than the labellum, greenish-white, the lateral 2 spreading, the middle one forming a hood over the gynostegium. The 2 inner segments shorter than the outer, glabrous, linear-oblong. Labellum almost flat, elliptical-obovate, yellow, glabrous along the margins which are sinuate and wavy, trilobed in front, with a violet or yellowish bad in the middle, surrounded with a brown velvety border. Middle lobe entire or bilobed, without appendix. Gynostegium obtuse, without beak. (P) Mediterranean region and Persia. March-April. *Malta*, met with here and there, but rather rare: at Verdala Park, Boschetto, Melleha, Wied Ghomor, Hauli, Santa Margherita, (Cospicua) Saline, Puales, Wardia, Fakkania etc. *Gozo*, rare, at Imgiar ix-Xini and Ta Cenc-*Ophrys insectifera* var. *lutea* Gouan. E. Yellow-Orchis. M. Zunzana.

OPHRYS FUSCA Link. Leaves short, flat, oblong-lanceolate, sometimes almost triangular, obtuse. Scape with 2 to 7 flowers, 1 to 3 diameter high. Labellum purplish black, or dark brown, velvety, oblong ovate, with 2 broad greyish or lead-blue, glabrous, contiguous bands. Middle lobe emarginate or sometimes almost entire. The reat u.s. (P) Mediterranean region. December-May. *Malta*, *Gozo* and *Comino*, frequent in many places and often common, especially at Boschetto, and on rocky and uncultivated ground at Ta Laurenti and Wied Encita.-*Ophrys insectifera* var. g. L. E. Brown Orchis. M. Dubbiena.

Var. *pallida* Raf. Plant smaller: scape shorter, with 2 to 4 flowers. Labellum yellowish or brownish yellow, with yellowish-white spots near the base, almost reflexed, with the median lobe almost entire. With the typical form, but rare. *Malta*, at Verdala Park, Boschetto, Wied Encita, Wied il Ghasel, San Tumas, Marsascala.

OPHRYS SPECULUM Link. Leaves flat u.s. but narrow. Scape 5 to 20 cm, with 2 to 5 flowers rather close together. Outer segments of perianth greenish-yellow, the laterals very spreading, the middle one forming a hood on the gynostegium. The two inner segments oval-triangular, arcuate-reflexed, about half the length of the outer, pubescent. Labellum oblong-obovate, revolute at the margin, purplish-black, with dense and long villous hairs along the margin, trilobed at the apex, with a large central, roundish, glabrous, bluish, shining spot in the middle, bordered with yellow. Lateral lobes small middle lobe emarginate. The rest u.s. (P) Mediterranean region. March-April. *Malta*, rare, at Wied Babu, St Julians, Verdala Park, Boschetto, Wied il ghasel, Misrah Ghonok, Wardia, Melleha. *Gozo*, much more frequent, being almost common at Ta Cenc, Xlendi, Kala Dueira, Nadur, Xaghra and Kala. *Comino*, rare, on rocky ground near Lazzaretto.-*Orphrys ciliata* Biv. O. *insectifera* var. d. L. E. Looking-glass Orchis. M. Dubbiena cahla.

## SERAPIAS L.

Tubers entire. Leaves linear-lanceolate, grooved. Outer segments of perianth connivent or connate, forming a hood; the two inner ones ovate at the base and abruptly acuminate, adherent by the tip to the outer segments. Labellum not spurred, trilobed, with lateral lobes erect, the middle lobe reflexed. Gynostegium terminating in a petaloid appendix. Pollinia each with a caudicle fixed on a common gland in a pit. Ovary not twisted. Includes 4 species, natives of the Mediterranean region and the Azores.

**SERAPIAS LINGUA L.** Tubers 2, one sessile and the other on a long pedicel or stoloniferous; leaves narrow, linear-lanceolate, grooved, acute. Scape 1 to 3 diameter high, with 3 to 5 flowers, with bracts shorter or longer than the flowers, pale-violet flushed green on the outside. Outer segments of perianth of same colour as the bracts, free only at the apex. Labellum not spurred, about twice as long as the outer segments, 8 to 10 mm broad and 13 to 20 mm long, purplish, rarely rosy or whitish, trilobed, with erect dark-purple lateral lobes enveloping the gynostegium; median lobe reflexed, oval-acute, glabrous or pubescent, with the callus slightly grooved, thick, shining red. Retinaculum solitary. Ovary not twisted. (P) Mediterranean region. March-May. *Malta*, very rare, at Misrah Ghonok and Wied il Ghasel near Musta, Wied Encita, Wied il Baruni; on rocky and uncultivated ground.-*Serapias oxyglottis* Bert. non W. E. Tongue-flowered Orchis.

Var. *parviflora* Parl.-*Serapias occultata* J. Gay.-*S. laxiflora* Chaub. Plant u.s. but shorter, glaucous or greyish-green. Outer segments of perianth free when in bloom. Labellum small, middle lobe 3 to 4 mm broad and about 8 mm long, as long as the lateral lobes, very reflexed and applied to the ovary, lanceolate, dark-purplish or brownish. (P) Mediterranean region. March-May. *Malta, Gozo and Comino*, frequent and often common on rocky and uncultivated ground, along country roads, walls of fields etc; but not forming patches like the typical form.

**SERAPIAS VOMERACEA Briq.** Tubers oval, mostly both sessile. Plant vigorous, with dull green foliage u.s. Scape 2 to 4 diameter high, with 5 to 10 flowers. Bracts reddish, as long as the flowers or longer. Outer segments of same colour, connate up to the apex. Labellum with 2 scale-like callosities at the base, very long, dark-purplish, paler towards the middle, sometimes pale-brown or reddish, with the median lobe villous, 6-10 mm broad and 15 to 25 mm long, lanceolate or oval-lanceolate. The rest u.s. (P) Mediterranean region. March-May. In valleys and on uncultivated ground. *Malta*, very rare; at Ghain Mula, Wied Hzeijen, Boschetto, Wied Ghar Dalam. *Gozo*, also very rare; Pergla, Ta Harrax-*Serapias longipetala* Pollini-*S. hirsuta* Lap.-*S. pseudocordigera* Moric.-*Helleborine longipetala* Ten.-*H. pseudocordigera* Seb.-*Orchis vomeracea* Burm.

**SERAPIAS CORDIGERA L.** Tubers one sessile and the other pedicelled. Scape 2 to 4 diameter high, with 3 to 6 flowers, in a short spike. Labellum trilobed, with lateral lobes orbicular, not extending or slightly extending beyond the outer segments: middle lobe more or less dark-purple, rarely



whitish or brown, villous, ovl-acuminate, cordate at the base, wavy along the margin. (P) Mediterranean region and the Azores. March-May. *Malta*, very rare; Wied Encita and Wied Kirda. *Gozo*, also very rare; Wied il Lunziata. E. Heart-flowered Orchis.

## ORCHIS L.

Herbs u.s. Outer segments of perianth spreading or conniving. Labellum spurred or saccate, trifid or trilobed or 3-toothed, rarely subentire. Gynostegium short. Pollinia 2, each with a caudicle and a gland, rarely with one gland in common, gland always enclosed in a pit or purse. Ovary commonly twisted. Includes about 73 species, natives of Europe, North Africa, temperate Asia; 2 being found in North America and 2 in the Mascarene Islands.

ORCHIS INTACTA Link. Leaves oblong, often spotted dark. Tubers ovoid. Scape 15-30 cm high, terminating in a dense cylindrical spike, 2 to 3 cm long. Bracts whitish, shorter than the ovary. Flowers very small. Outer segments more or less connate, free only at the apex, ovate-acuminate, rosy-red, lined purple, the lateral segments almost baggy at the base. Labellum rosy-red, self-coloured, small trifid, with very narrow lobes, the middle lobe being emarginate or bifid. Spur and gynostegium very short. (P) Mediterranean region, Madeira and the Canaries. March-April. *Gozo*, Very rare; Ta Cenc, in moist shaded localities, according to Gulia.-*Orchis atlantica* W.-O. secundiflora Bert-Tinea intacta Boiss-T. cylindracea Biv.-*Noetinea cylindracea* Rehb. f.

ORCHIS MORIO L. Tubers u.s. Leaves oblong-lanceolate. Scape 1 to 3 diameter high. Bracts narrow, violet, 8 to 15 mm long. Flowers purple-violet, very rarely rosy or white. Labellum roundish, violet self-coloured, with a whitish base, and usually with dark violet dots on the disk, trilobed, rarely simply toothed. Spur about as long as the ovary. (P) Europe, Western Asia as far as Siberia. February-April. *Malta*, very rare; on hilly rocky ground, at Wardia, Bingemma, Tal Gholia. *Gozo*, also very rare; Migiarro-*Orchis Nicodemi* Cyr. ex Ten. I. Zonzelle, Giglio caprino.

ORCHIS LONGICORNU Poir. Tubers and leaves u.s. Scape 1 to 3 diameter high, with a loose sub-cylindrical spike. Bracts purplish, 6 to 8 mm long. Flowers purplish-violet, rarely light rose or white. Labellum trilobed, 8 mm long, with lateral lobes dark-violet, the rest rosy or whitish, with short or very short median lobe, usually with dots almost in pairs, rarely without dots. Spur subequal to the ovary, about 12 mm long, spatulate-clavate at the apex. The rest u.s. (P) Western Mediterranean region. February-April. *Malta*, in exposed weedy localities, at Wied Babu, according to Delicata; at Wied Mokbel, Marsascala and Zurrigo, according to Gulia. *Gozo*, at Pergla, according to Gulia. Must be very rare, as it was never again collected by others-*Orchis longicornis* Auct.

ORCHIS CORIOPHORA L. Tubers u.s. Leaves u.s. without spots. Scape leafy ½ to 2 diameter long, with a dense oval-cylindrical spike, 4 to 10 cm

long. Bracts usually longer than the ovary. Flowers brownish-purple, sometimes greenish-purple, very rarely whitish. Outer segments u.s. Labellum trilobed 5-9 mm broad, median lobe entire. Spur half the length of the ovary, which is twisted. (P) Central Europe and the Mediterranean region. April-May. *Malta*, *Gozo* and *Comino*, frequent in many places; especially abundant in *Comino* along the road from Kala Santa Maria to Lazzaretto. The form: *cimicina* Cranz, with smaller flowers, having a disagreeable smell, is about as frequent as the form: *fragrans* Pollini which has larger flowers with a fragrant or aromatic odour. A double-flowered form in which the 3 inner segments develop as 3 labella, is sometimes met with in the Verdala Park and Boschetto. I. Cipolla or Giglio cimiciattolo.

ORCHIS TRIDENTATA Scop. Tubers round or roundish. Leaves oblong, greyish-green. Scape 1 to 3 diameter high, with a dense globose or oval-conical spike. Bracts rosy-white, usually shorter than the ovary. Flowers rosy-red, or rosy, rarely white. Outer segments connate at the base, clear violet, rarely white, acute, ovate-lanceolate. Labellum trilobed, more or less pendulous, having the lateral lobes linear-spathulate and truncated, the middle lobe being obcordate, bilobed, often with a very short recurved toothed between the lobes. Spur about the length of the ovary. (P) Central Europe, the Mediterranean region and the Caucasus. December-March. *Malta*, rather rare, at Wied Babu, Wied Zhuber, Wied Encita, Boschetto, Has-Saptan. *Gozo*, rare, Wied il Lunziata. The form: *commutata* Tod., with very acuminate outer segments, in a stronger plant, is rarely met with at Wied Babu and Bahria.

Var. *lactea* Poir. Plant smaller; scape  $\frac{1}{2}$  to  $1\frac{1}{2}$  diameter high. Flowers smaller, rosy-white, of various shades; labellum pendulous u.s., median lobe entire or emarginate.-*Orchis acuminata* Desf.-*O. parviflora* Ten. *Malta*, *Gozo* and *Comino*; frequent in valleys and on uncultivated ground. In certain places, as at wied Encita, Wied il Ghasel and Boschetto, it is often common. The form: *lactiflora* mihi, with pure milky white flowers, is occasionally met with at Wied Encita and on the rocky ground between Boschetto and Maddalena Church near Dingli.

ORCHIS LONGICRURIS Link. Tubers oblong, sometimes bifid. Leaves large, oblong-lanceolate, dull green, wavy along the margin. Scape 2 to 3 diameter high, with a dense ovate spike. Flowers rosy, rarely rosy-white or white (form: *albiflora* Nicotra), sometimes with the outer segments almost violet, usually with darker veins. Bracts about the length of the ovary. Outer segments entirely free. Labellum trilobed, with linear lateral lobes, about 1 mm broad; median lobe bifid, with lobes as long and as broad as the laterals. Spur about half the length of the ovary. (P) South Europe, Asia Minor and Algeria. March-May. *Malta*, in moist stony valleys, rare: at Wied Babu, Wied iz-Zurriek, Wied il Ghasel. *Gozo*, rare, at Gnien Imric-*Orchis militaris* Poir. non L.-*O. undulatifolia* Biv.-*O. tephrosanthos* Zeraph non Vill. M. Haija u meita tal uerka fdeuxa.

ORCHIS PYRAMIDALIS L. tubers round or oval, entire. Leaves lanceolate-linear, green. Scape 1 to 5 diameter high, leafy at the base. Spike very

dense, globose, oval or conical; bracts as long as the ovary or longer, rosy-violet, with simple nerves. Flowers small, purple or rosy-purple, very rarely white. Outer segments oval-lanceolate. The two inner segments acute. Labellum trilobed: lobes all subequal, median lobe same as the laterals; with two paler protruding scales or callosities at the base of the labellum. Ovary very twisted. Spur filiform, as long as the ovary or longer (P) Central Europe and the Mediterranean region. April-June. *Malta*, *Gozo*, *Comino* and *Cominotto*, very frequent and often common in valleys, on rocky and uncultivated ground, especially in moist places looking north, as at Boschetto-Anacamptis pyramidalis Rich. The form usually met with has a very dense conical, or acutely conical, spike at the commencement of blooming, becoming afterwards oval or oblong; the bracts are then also much longer than the ovary and their acuminate apex is produced beyond the buds, hence it was called: comata, by Sommier and Caruana-Gatto. E. Pyramidal Orchis.

Var. Sommieriana mihi-Orchis condensata Urv. non Desf.-Anacamptis Urvilleana Somm. et Caruana-Gatto-Orchis pyramidalis var. Urvilleana Fiori. Spike at first broadly conical and afterwards oval or oblong; bracts often shorter than the ovary. Flowers smaller, delicate pale-rose. Internal segments obtuse. Plant usually smaller, flowering in March or early in April. *Malta* and *Gozo*, endemic; but rather rare although sometimes found growing in batches. *Malta* at wied Babu, Wied il Ghasel, San Paul tat-Targia, Wied Encita, Wied Ghomor, Ta Baldu, Puales, Wardia. Never found at Boschetto where the typical form is so common. *Gozo*, at Xlendi and Imgiar ix-Xini. The form: albiflora mihi, with pure white flowers sometimes tinted yellow, flowering in February-March, is rarely met with at Wied Babu, Wied il Ghasel, Wied iz-Zurriek and Wardia. The name Orchis Urvilleana was first given by Steudel to a variety or form of *O. sancta* L., native of Asia Minor and Syria, and is considered as a synonym of this species, hence according to the law of priority the same name cannot be given to our plant.

ORCHIS SACCATA Ten. Leaves ovate-elongated, acute, sometimes spotted black. Scape  $\frac{1}{2}$  to  $1\frac{1}{2}$  diameter high, with a spike of 2 to 12 flowers. Bracts large, longer than the ovary, reddish-violet, with several nerves. Outer segments oblong, obtuse, purple, greenish on the outside. Labellum reddish-violet, with several nerves. Outer segments oblong, obtuse, purple, greenish on the outside. Labellum reddish-violet, very rarely rosy or white, oval or round, entire, wavy or crenulate along the margin, with darker veins. Spur broad, bag-like, 2 or 3 times shorter than the ovary. (P) Mediterranean region and Persia. January-March. *Malta*, frequent here and there, but always sporadic; Glacis of Floriana, Wied iz-Zurriek, Hal Far, Corradino, Hauli, Boschetto, Wied Gherzuma, Dingli, Verdala Park, Fakkania, Imghieret, Casal Luca etc. *Gozo*, also frequent here and there, as at Imgiar ix-Xini, Ta Cenc, Migiarro, Kala etc.

## Corrigenda and Addenda.

Page 96.

Before PHYTOLACCACEAE insert:

MIRABILIS JALAPA (L.) Juss., native of Peru, belonging to the family Nyctaginaceae, is naturalised in many gardens, San Antonio, Boschetto, Ditches of Floriana etc., where it was formerly cultivated. The typical or wild form, having magenta-red flowers, is that more commonly met with. Other forms bearing larger flowers, white, yellow, red or variegated, are cultivated, and are met with as garden escapes. E. Marvel of Peru. I. Bella di notte. Meraviglie. M. Hummejr.

Page 117.

After FUMARIA CAPREOLATA L. Var. flabellata Gasp., insert:

Var. speciosa mihi. Plant robust, bushy or slightly sarmentose. Stems with 5 acute angles, almost winged, one of the enclosed spaces being narrower than the other. Flowers in large ovate racemes, becoming elongated when in fruit, on peduncles usually less than 1 cm long. Flowers 1½cm in total length, rosy-white or rosy, tipped dark-purple, on pedicels about 4 mm long when in fruit. Bracts just shorter than the pedicels in fruit. Sepals ovate-lanceolate, acuminate, toothed, green-keeled. Fruit on erect and spreading pedicels, globose, compressed dorsally, keeled laterally, obtusely apiculate, smooth, about 3 mm in diameter. *Malta*, frequent among crops, in fields at the Marsa, near Addolorata Cemetery, and Casal Luca.

Page 136

After CAPPARIS SPINOSA L., add:

The typical spinous form, with spiny stipules recurved and persistent, is very rare. Collected for the first time by Penza in 1927, at the Addolorata Cemetery.

Page 202

TRIFOLIUM TOMENTOSUM read TTRIFOLIUM TOMENTOSUM L.

Page 210

Before Var. subvillosus L. insert:

The typical form, with a loosely convolute legume, and short conical tubercles instead of spines, is now sometimes cultivated as forage, but much less frequently than Var. subvillosus L.

Page 230.

After APIUM GRAVEOLENS L., add:

APIUM NODIFLORUM Lag., Rehb. f. Plant perennial, diffuse, rooting at the branches and partly with stolons. Stems branched and hollow, well-developed. (1-6 diameter long). Leaves pinnatoseptate, with oval or oval-lanceolate toothed segments. Umbels partly terminal and partly opposed to the leaves, with 5-12 rays, on peduncles shorter than the rays. Involucre absent or reduced to 1 or 2 caducous bracts. Involucel of several persistent bracts. Calyx with indistinct limb. Petals greenish white. Fruit ovoid-globose. (P) March-July. Central And Southern Europe, Western Asia, north and south Africa, Abyssinia.-Sium nodiflorum L.-S. latifolium Ucria non L.-Helosciadium nodiflorum Kock. *Malta* frequent and often common in moist valleys, along streamlets, and along stone-channels on irrigated lands, at Gneina, Imtahleb, Ghain Tuffieha, Bahria, Wied Gherzuma, Fiddien, Melleha, Gnien Ingrau, Ghain il Cbira, Ghirghenti etc. Gozo, at Imgiar and Zenka, wied il Lunziata, Xkendi, Marsalforno. I. Sedanina d'acqua, Gorgalestro, Schiavone. M. Carfus tal ilma, Carfus tal Wied.

Var. intermedium Lac. Umbels partly terminal and partly axillary, usually dwarfer, and more furnished with stolons-Sium stoloniferum Guss-Helosciadium stoloniferum Nym-H. intermedium Nym-Apium nodiflorum var. stoloniferum Paol. *Malta*, frequent with the species and often replacing it.

Page 253

After CONVULVULUS OLEAEFOLIUS Desr. add:

CONVOLVULUS CNEORUM L. Plant perennial with perennial rootstock and woody at the base, with twigs herbaceous in their upper part, 1-6 diameter long; more or less erect and much branched, with a silky silvery pubescence in all its parts. Leaves densely fascicled, or in tufts at the end of the sterile twigs, narrow, entire, oblong-spathulate, or lanceolate but wider at the upper part. Flowers in dense clusters at the end of the fertile branches, white, or very slightly rosy, and silky on the outside, with very short peduncles and pedicels, with lanceolate bracts inserted much below the calyx. Corolla thrice

as long as the calyx, this last having oblong mucronate segments. Ovary bilocular; stigmas long, slender and papillose. Capsule 4-valved. (P) or (S) March-May. Italy, Sicily, Greece and Dalmatia. *Malta*, Ghain Tuffieha, Mistra, Selmun, Melleha, Ahrax, Imtahleb, Bahria. Gozo, at Kala, Nadur, Chambray, Ta Cenc. Often confused with *C. oleaefolius* Desr. which is more common in the same localities, and also with *C. Cantabrica* L. which is much rarer, having been collected only at Intahleb and Ghain Tuffieha. M. Leblieb.

Page 255.

CONVOLVULUS SEPIUM L. read CONVOLVULUS SEPIUM L.

Page 255.

After CONVOLVULUS SEPIUM L. add:

CONVOLVULUS SOLDANELLA L. Plant perennial, or with perennial rootstock, and stoloniferous. Stems prostrate, but not voluble, 1-6 diameter long. Leaves cordate-reniform, furnished with a long petiole, rather fleshy, entire or angular, often emarginate. Peduncles subequal to the leaf, or just long, one-flowered, with broadly oval bracts, obtuse, accrescent. Corolla large, rosy, about 4 times as long as the calyx, of short duration. Capsule globose, about 1 cm in diameter, or larger. (P) Central and Southern Europe, Asia Minor, North Africa, South America, California, Australia and New Zealand. April-May. *Malta*, very rare, in sandy places close to the sea; at Ahrax, on the sandy beach at Kala tal Armiel and Kala tal Kortin.-*Calystegia Soldanella* R. Br. I. Cavolo di mare, Soldanella. M. Leblieb tal bahar.

Page 281.

After HYOSCYAMUS ALBUS L., add:

HYOSCYAMUS NIGER L. Plant u.s., very villous and glandular. Leaves flaccid, of oblong form, acuminate, deeply toothed or pinnatifid; the lower petiolate and sometimes with two wings at the base of the petiole; the upper sessile and amplexicaul. Flowers sessile or very shortly pedicelled, mostly clustered towards the end of branches. Calyx in fruit swollen at the base, with mucronate teeth. Corolla pale yellow, with a dense network of purplish veins, and purplish at the bottom. (A), (B) or (P) April-July. Europe, North Africa, Western Asia as far as Siberia and Northern India. *Malta*, rare, a recent introduction; found naturalised (1927) along the railway line between Attard and San Salvatore Station. E. Common Henbane. I. Giusquiamo nero. M. Mammazeiza.

Page 328.

Before ANACYCLUS L. insert:

CLADANTHUS ARABICUS Cass.-C. proliferus D.C.-Anthemis arabica Willd., was collected in April 1925 by Count A. Caruana Gatto, in single specimens, among growing crops in a field along the Mistra-Selmun road (*Malta*). This species is native of Lybia and Eastern North Africa as far as Arabia. The plant is erect, up to 4 diameter high, branched, with glaucous leaves divided into capillary segments, and large terminal golden-yellow heads, surrounded with large leafy bracts divided into capillary segments, and broad acute scarious scales ciliated along the margin. Secondary terminal heads are formed on branches arising at the base of the first heads.

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Schlecht. ....	263	Zea Mayz L. ....
		Zizyphus Juss. ....
		Zizyphus sativa Gaertn. ....
		Zostera L. ....
		Zostera marina L. ....

## X.

minor Nolte ....

Xanthium L. ....	338
Xanthium spinosum L. ....	338

## Further Addena.

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After VICIA NARBONENSIS L. var. serratifolia Jacq., inset:

VICIA PANNONICA Crantz. Plant annual, prostrate or climbing, hairy or hirsute. Leaves with 4 to 8 pairs of oblong or oblong-linear leaflets, obtuse or emarginate, the petiole finishing in a simple or slightly branched cirrhous. Lower stipules broadly hemi-hastate, the upper oval-acute, all entire and with a roundish spot. Flowers setaceous teeth, the lower ones longer and subequal to the tube of same. Corolla  $1\frac{1}{2}$  to 2 times as long as the hirsute. Seeds globose. (A) April-May. Central and Eastern Europe, Italy, Western Asia, Algeria, naturalised in France. The typical form is unknown in the Maltese Islands.

Var. striata M.B. Corolla purplish-brown, with veined standard.-Vicia purpurascens D.C. Sicily, Southern Italy and Western Asia. *Malta*, here and there, in the fields around the Poor House. First found by me in April 1927.

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After VICIA HIRSUTA S.F. Gray, insert:

VICIA MONANTHA Retz. Plant annual, slightly pubescent with applied hairs. Stems angular and striated, prostrate or climbing, 2-6 diameter long. Upper leaves with 5 to 9 pairs of oblong leaflets, rarely linear, obtuse or emarginate, often mucronulate, petiole terminating in a branched cirrhous. Stipules semi-hastate, deeply bifid, with the appendix often bifid, so that the stipule has three laciniae. Peduncles shorter than the leaves, usually terminating in a

short awn, bearing 1 to 4 flowers 15 to 17 mm long. Calyx hirsute, with oblique throat, with the lower toothe longer than the others but shorter than the tube. Corolla purplish-violet, with the standard longer than the wings. Legumes oblong, flat, about 1 cm broad and 4 cm long, usually with 6 seeds. (A) Western Asia, North Africa, Southern Italy, Sicily, Sardinia and Lampedusa, the Canaries, naturalised in Southern France. April-May. *Vicia calcarata* Desf.- *V. syriaca* Weinm. *Malta*, rather rare, among weeds in gardens at C. Attard. The plants collected belong to the form: *triflora* Ten., with peduncles bearing 1 to 4 flowers, and glabrous legumes. First collected by me in April 1927.